NO. 143

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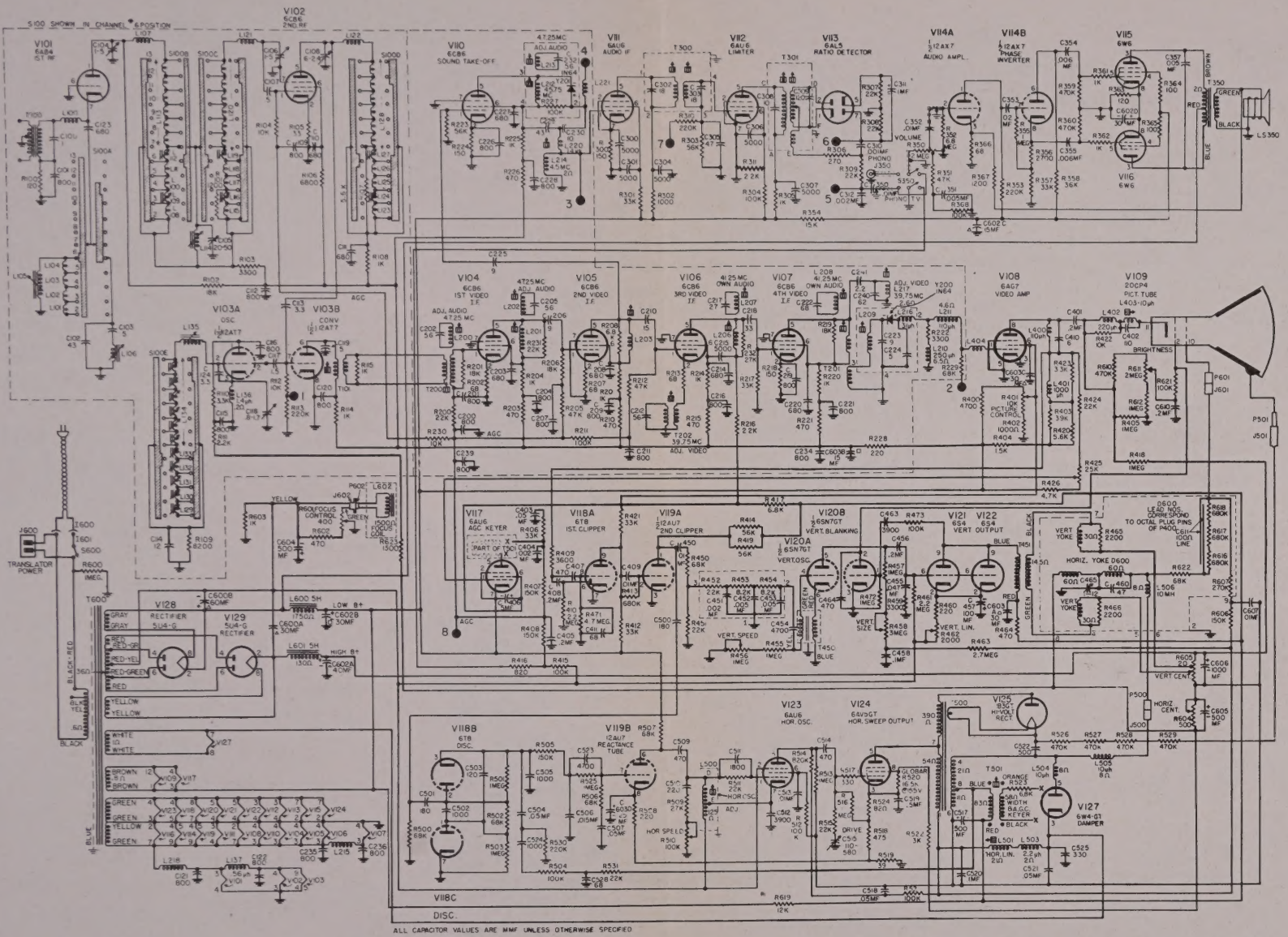
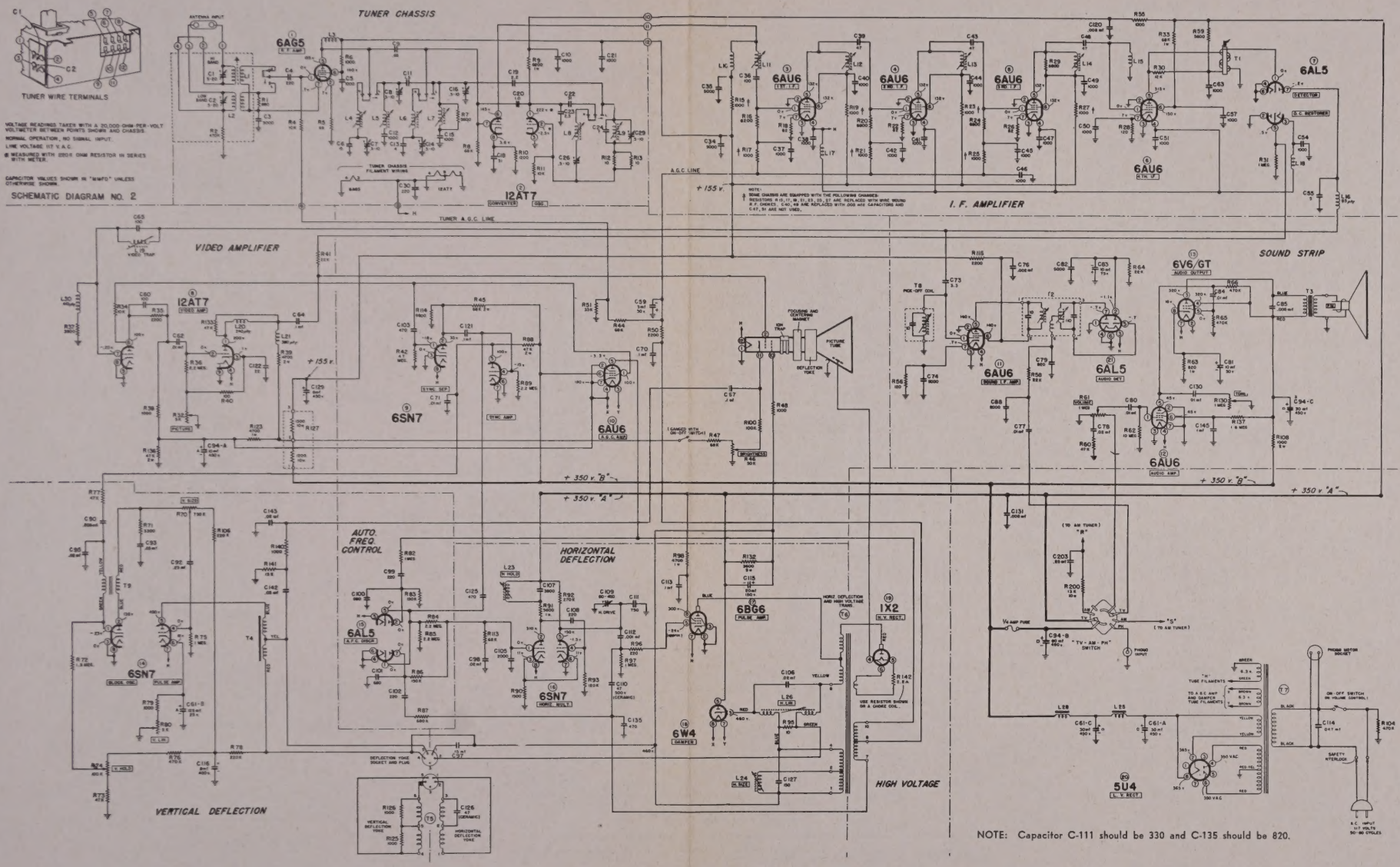
The suffix letter "A," following the Folder number, indicates a "Preliminary Data Folder," designed to provide immediately data on television receivers—pending coverage in standard PHOTOFACT Form.



The Cooperation of the Manufacturer of This Receiver Makes It Possible to Bring You This Service. GENERAL ELECTRIC MODELS 20C150, 20C151.



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RAYTHEON MODEL RC-1720A (Ch. 17AY27)

PRELIMINARY DATA
The data contained in this folder is published in advance of regular PHOTOFACT Coverage

SET 143 FOLDER 1A

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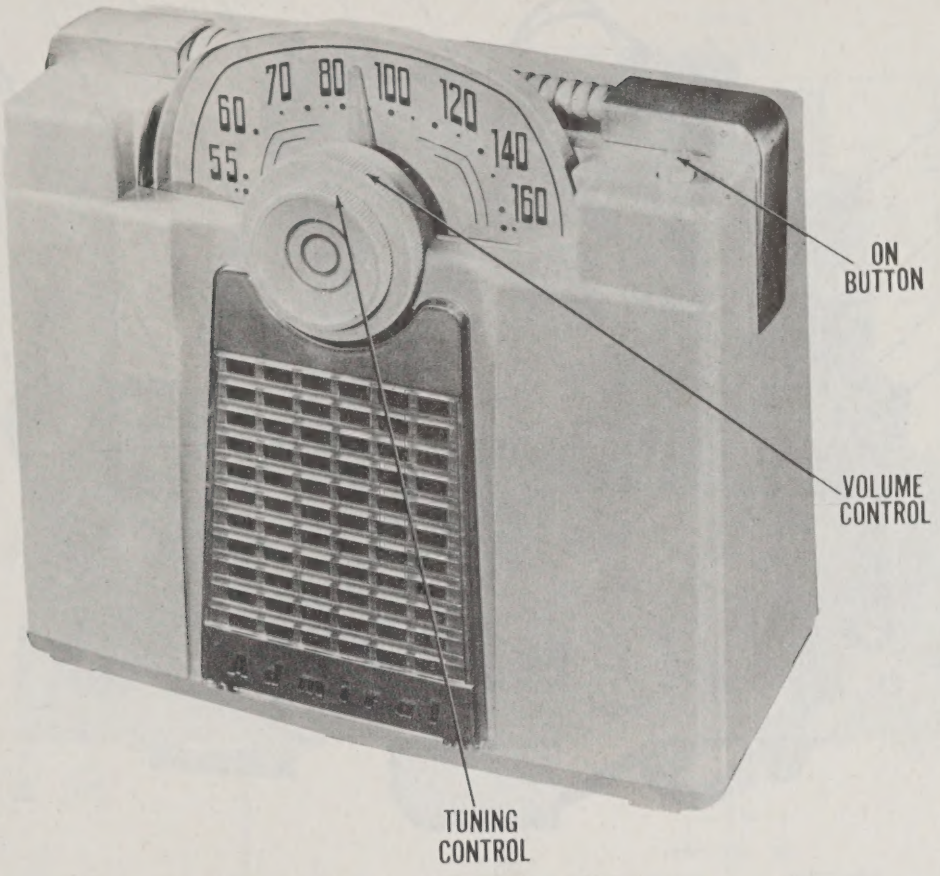

ADMIRAL MODEL 4W19

TRADE NAME	Admiral, Models 4T11 (Ch. 4T1), 4W18, 4W19 (Ch. 4W1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago, Illinois
TYPE SET	Three Power Operated Portable Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 1R5 Converter, 1U4 IF Amp., 1U5 Det.-AVC-AF, 3V4 Power Output
POWER SUPPLY	110-120 Volts AC-DC or 7.5 Volts "A" Supply and 67.5 Volts "B" Supply
RATING	.18 Amp. @ 117 Volts AC or 48MA @ 7.5 Volts DC and 9.4 MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning gang fully closed. Loosen the pointer set screw and set pointer to the two dots below 55 on the dial. Tighten set screw.
Use battery power if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1Mfd.	High side to stator on rear section of tuning gang. Low side to B-	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer reduce dummy antenna to 200MMF to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.
	Replace chassis, loop and batteries in case.						
3.		Loop	1400KC	1400KC	Not used.	A6	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ADMIRAL PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det. -AVC-AF	1U5	1U5	6BW	
V4	Power Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	30	150	67C7-41	AFH3-06		UPE42215		TVL-3437	Filter
B	20	150							Filter
C	20	150							Filter
C2	100	25	67A4-6	PRS25/100		BRH251A		TVA-1207	Fil. Bypass
C3	250		65B6-5	SI250	D6-251	5W5T25	GP2K-251		RF Coupling
C4	.01	400	64B-1-25	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AVC Filter
C5	100		65B6-3	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Osc. Grid Cap.
C6	.25	200	64B1-28	P488-25		GT2P25		2TM-P25	Fil. Bypass
C7	5000		65A10-5	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Osc. Anode Cap.
C8	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	IF Amp. Grid
C9	100		65B6-3	SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Diode RF Filter
C10	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Audio Coupling
C11A	.005		♦63A4-3	SI5000	♦PC-91	1D5D5	GP2-333-503	5HK-D5	AF Amp. Screen
B	100			SI100		5W5T1	GP1K-101	5GA-T1	AF Amp. Plate
C	.005			SI5000		1D5D5	GP2-333-502	5HK-D5	Audio Coupling
C12	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Output Plate
C13	.047	400	64B8-28	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C14	.1	200	64B1-30	P288-1	DF-104	PTE4P1		2TM-P1	Line Isolation

♦ Items C11A, C11B, C11C, R11A, R11B, R11C are combined into one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	1Meg	½	75B1-37	Q13-137	AG-63-Z	B-70	Volume Control-See Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Attach to R1A Per Instructions

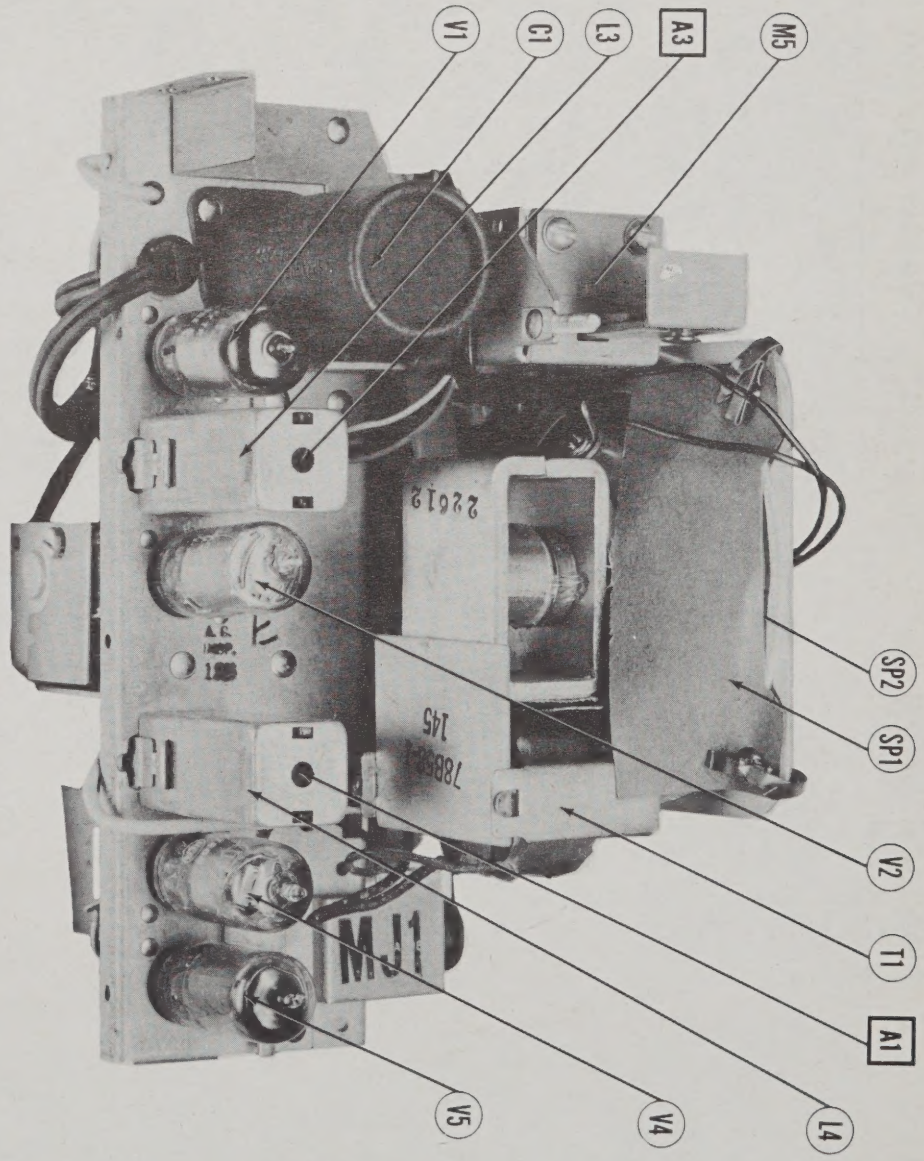
Note- Model 4T11 uses control having part number 75B1-43.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	
R2	2.2Meg	½	60B8-225	BTS-2.2Meg	Conv Grid
R3	100KΩ	½	60B8-104	BTS-100K	Osc. Grid
R4	18KΩ	½	50B8-183	BTS-18K	Osc. Anode
R5	270Ω	½	60B8-271	BTS-270	Conv. Filament Shunt
R6	3.3Meg	½	60B8-335	BTS-3.3Meg	AVC Network
R7	10Meg	½	50B8-106	BTS-10Meg	IF Amp. Grid
R8	390Ω	½	60B8-391	BTS-390	IF Amp. Filament Shunt
R9	10Meg	½	60B8-106	BTS-10Meg	AF Amp. Grid
R10	120Ω	½	60B8-121	BTS-120	AF Amp. Filament Shunt
R11A	4.7Meg	½	63A4-3 ♦	BTS-4.7Meg	AF Amp. Screen
B	1Meg	½		BTS-1Meg	AF Amp. Plate
C	2.2Meg	½		BTS-2.2Meg	Output Grid
R12	2200Ω	½	60B8-222	BTS-2200	Filament String
R13A	1380	5	61A5-7		Filametn Dropping-Wire Wound
B	1380				Filament Dropping-Wire Wound
R14	2700Ω	1	60B14-272	BTA-2700	Filter
R15	47Ω	1	60B14-470		Surge Limiter

♦ Items R11A, R11B, R11C, C11A, C11B, and C11C are combined into one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ADMIRAL	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T1	7KΩ	4.6Ω	465Ω	.7Ω	98A21	A-3878	A-2931	RO-13 ①	① Bend mounting tabs down file out slots and mount on original brackets.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	V. C. IMP.	ADMIRAL PART No.	VIKING PART No.	QUAM PART No.	
SP1	PM	4.6Ω	78B58-1	35J4	3A07	
	CONE DIA.	V. C. DIA.				
SP2	3 3/8"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	
L1	Loop Ant.	.3Ω		69C120-1		
L2	Osc. Coil	7Ω	1.8Ω	69A35-5		
L3	1st IF	21Ω	21Ω	72B28-1		
L4	2nd IF	21Ω	21Ω	72B28-62		

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	ADMIRAL PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.062A	93A1-6	NB-5	5M4	

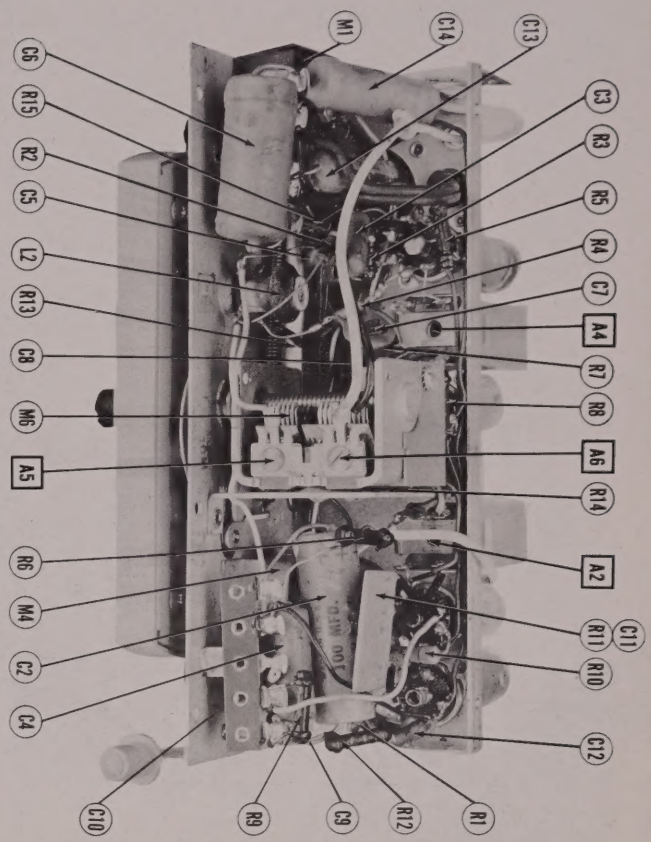
BATTERIES

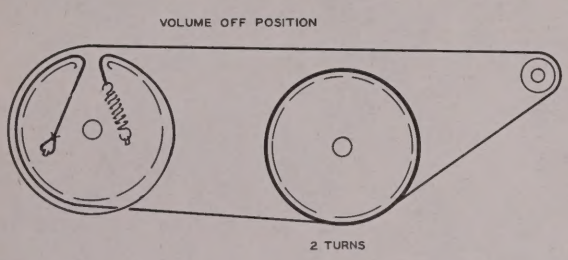
ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V "A"		717			C5			
M3	67.5V"B"			467			XX45		

MISCELLANEOUS

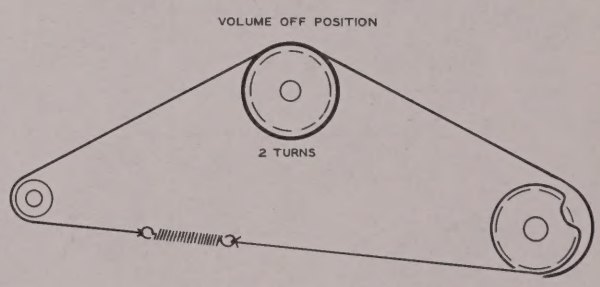
ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M4	Switch	77A23	On-Off
M5	Switch	77A19-1	AC-DC/Battery
M6	2 Gang Var. Cap.	68B34-1 or	(16-299MMF, 19-157MMF)
		68B41 †	† 4T1 Chassis
	Cabinet	34D35-5	Model 4W18
	Cabinet	34D35-7	Model 4W19
	Cabinet	34D44-1	Model 4T11
	Dial Pointer	25B47-1	Ch. 4T1
	Dial Pointer	25A40	Ch. 4W1
	Dial Scale	22C25-5	Model 4W18
	Dial Scale	22C25-7	Model 4W19

CHASSIS—BOTTOM VIEW





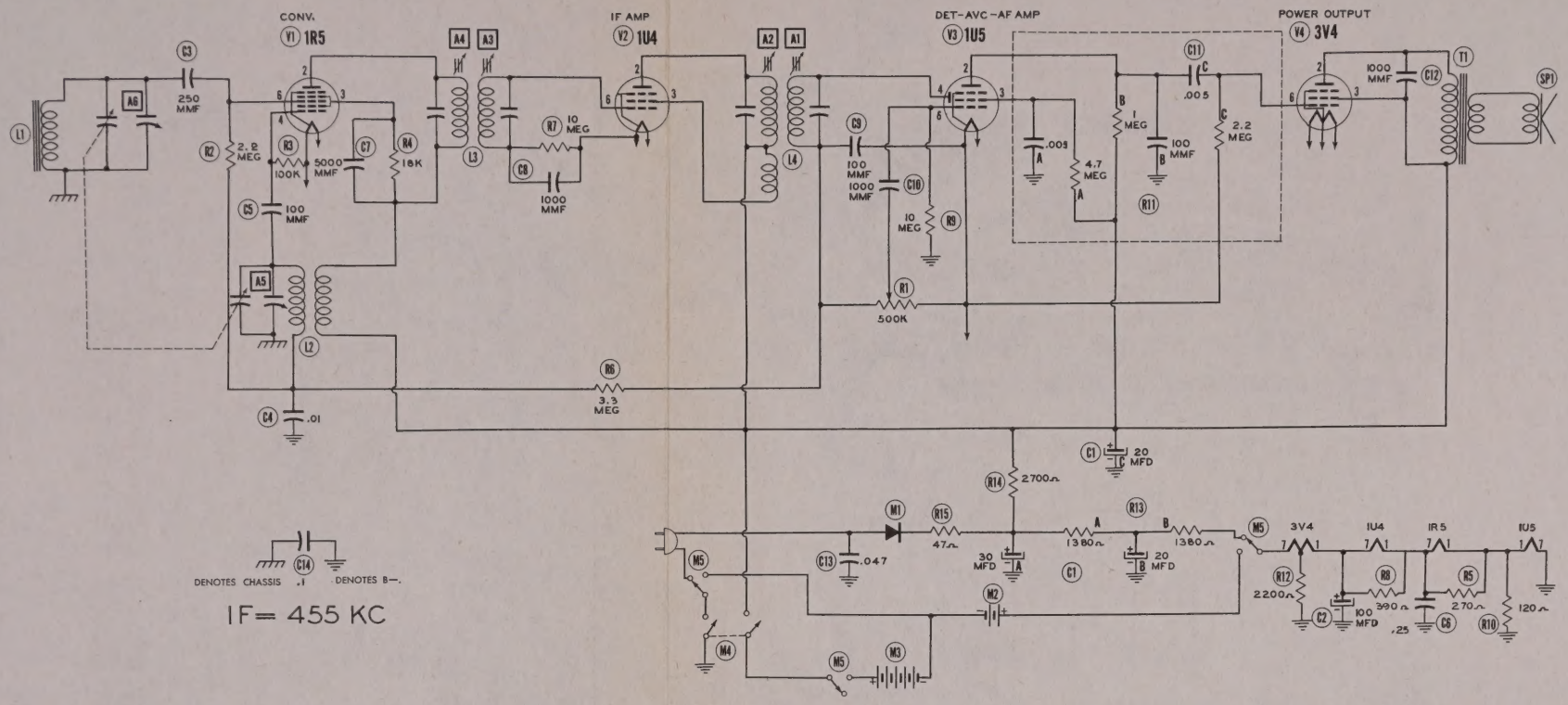
CHASSIS 4T1



CHASSIS 4W1

VOLUME CORD DRIVE

Before restringing the volume cord on these models, rotate volume control fully clockwise and, using a #6 Allen wrench, tighten the set screw on the volume control pulley, first being sure the cut-out slot(s) on the volume control pulley are in the position shown in each illustration. Loop the cord in the cut-out slots, winding 1½ turns around the volume tuning sleeve on the 4W1 chassis or the volume-off knob on the 4T1 chassis. Loop the cord around the fibre pulley at other end of chassis. To prevent slipping, be sure that the volume control turns freely and that the dial cord tension spring has sufficient tension.



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	1.2VDC	80VDC	49VDC	6-12VDC	1.2VDC	.6VDC	2.6VDC
V 2	1U4	2.6VDC	80VDC	80VDC	80VDC	2.6VDC	0V	3.9VDC
V 3	1U5	1.2VDC	14VDC	13VDC	.1VDC	0V	0V	0V
V 4	3V4	3.9VDC	75VDC	80VDC	0V	5.2VDC	.1VDC	6.4VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.7KΩ	†20KΩ	100KΩ	*	6.5Meg	*
V 2	1U4	*	†2.7KΩ	†2.7KΩ	†2.7KΩ	*	10Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	Inf.	10Meg	*
V 4	3V4	*	†3.2KΩ	†2.7KΩ	Inf.	*	2.2Meg	*

ALL MEASUREMENTS TAKEN WITH AC-DC / BATTERY SWITCH IN AC-DC POSITION.

§ TAKEN WITH VACUUM TUBE VOLTMETER

* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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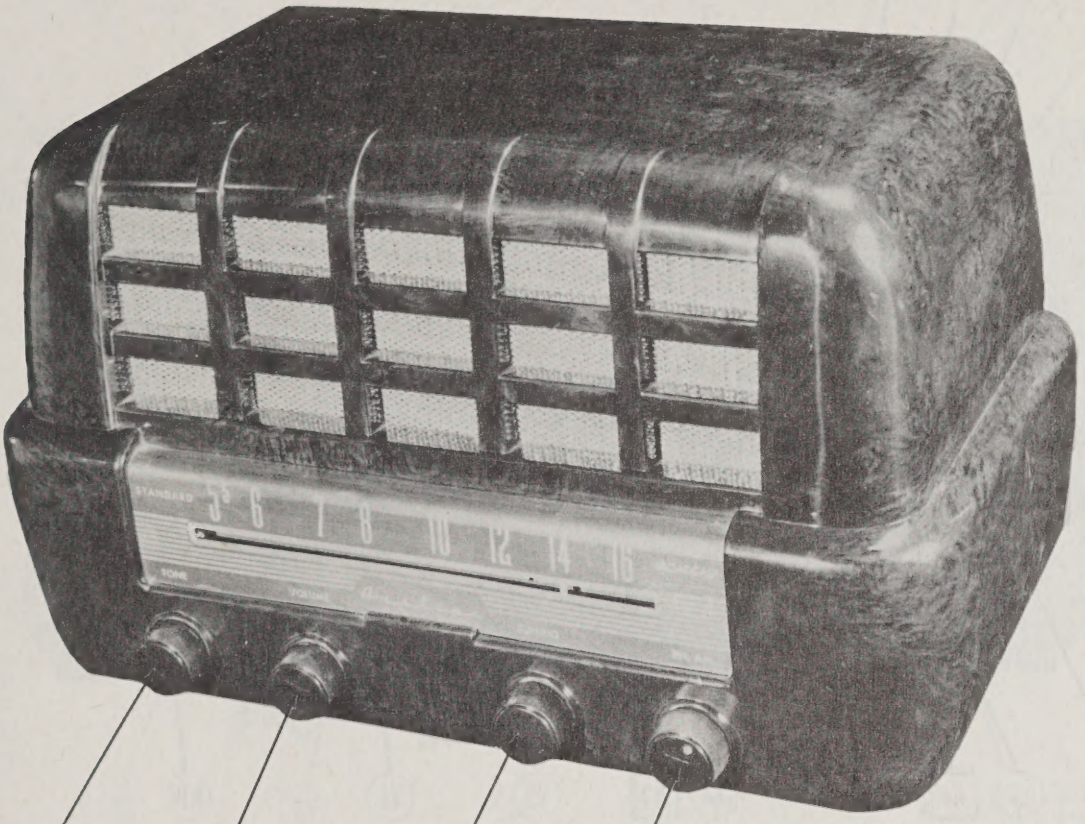
AIRLINE
MODEL 15BR-1547A



AIRLINE
MODEL 15BR-1547A

TRADE NAME	Airline, Model 15BR-1547A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FOUR)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 Det.-AVC-AF, 50L6GT Power Output
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1Mfd.	High side to stator on rear section of tuning gang. Low side to B-	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .00IMFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.	"	"	535KC	Tuning gang fully closed.	"		Check for proper tuning range. If necessary bend rotor end plates on osc. section of tuning gang. If plates are changed repeat steps 2 and 3.

4. Replace set in cabinet. Radiate 1400KC signal into loop, and tune in generator signal. If necessary move pointer to 1400 on dial scale. Adjust antenna trimmer A6 for maximum output.

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PARTS LIST AND DESCRIPTIONS

AIRLINE
MODEL 15BR-1547A

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA AIRLINE PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF	12AV6	12AV6	7BT	
V4	Power Output	50L6GT	50L6GT	7AC	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	8C-19829			EDL8415C		R1119	Filter
B	50	150				LBR5015A			Filter
C	50	150							Filter
D	40	25							Output Cathode
C2	.05	200	8D-10770	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3A	50		♦201-15005	SI50	♦PC-50	5W5Q5	GP1K-500	♦100C1	Diode RF Filter
B	50			SI50		5W5Q5	GP1K-500		Diode RF Filter
C4	.02	200	8D-11304	P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C5	220		8G-14459	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	AF Amp. Plate
C6	.05	200	8D-10770	P288-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C7	.005	600	8D-10935	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C8	.01	200	8D-17258	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C9	.005	600	8D-10935	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Output Plate
C10	.09	400	8D-11251	P488-1	DF-104	PTE4P1		4TM-P1	Phono Isolation
C11	.18	400	8D-11111	684-2		GT4P2			Line Isolation
C12	.047	400	8J-16081	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter

♦ Items C3A, C3B, R6 are combined into one unit.

CONTROLS

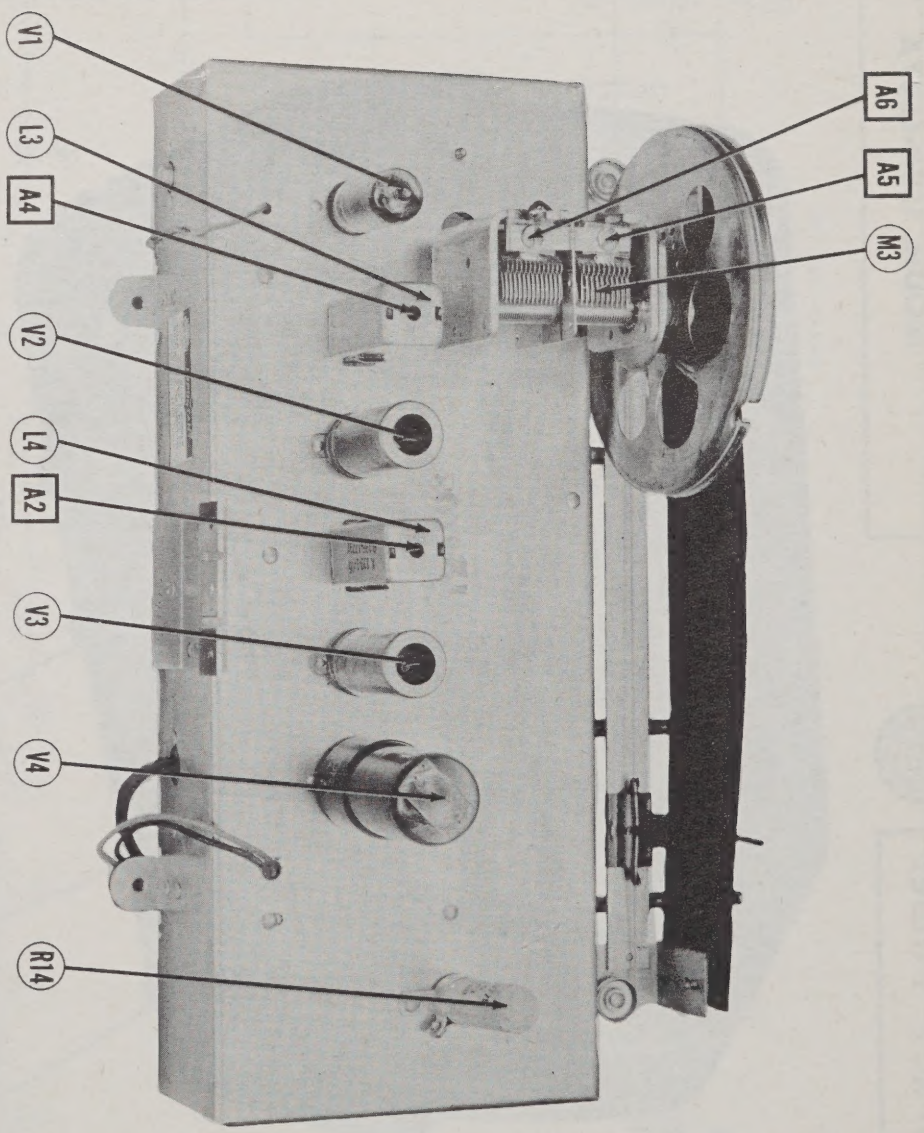
ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES	
R1A	1Meg	½	10A-19606	Q18-137X	AT-103	BTSK-72-S	Volume Control-Tapped @ 100KΩ.
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A Per Instructions.
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A Per Instructions.
R2A	1Meg	½	11B-15852	Q13-137	AG-63-Z	BSK-70	Tone Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R2A Per Instructions.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
R3	47KΩ	½	9B1-82	BTS-47K	Osc. Grid
R4	2.2Meg	½	9B1-33	BTS-2.2Meg	AVC Network
R5	150Ω	½	9B1-52	BTS-150	IF Amp. Cathode
R6	47KΩ	½	201-15005 ♦	BTS-47K♦	Diode Filter
R7	6.8Meg	½	9B1-36	BTS-6.8Meg	AF Amp. Grid
R8	220KΩ	½	9B1-90	BTS-220K	AF Amp. Plate
R9	33KΩ	½	9B1-80	BTS-33K	Tone Comp
R10	470KΩ	½	9B1-29	BTS-470K	Output Grid
R11	150Ω	½	9B1-52	BTS-150	Output Cathode
R12	1200Ω	1	9B1-63	BTA-1200	Filter-See Note
R13	150Ω	1	9B2-52	BTA-150	Filter
R14A	195Ω	4.5	9M-19778		Filament Dropping-Wire Wound
R14B	50Ω	4			Rectifier Ballast
R15	220KΩ	½	9B1-90	BTS-220K	Isolation

♦ Items R6, C3A and C3B are combined into one unit.
Note- Some models use paralleled resistors in this application to obtain desired resistance.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.8KΩ	4.2Ω	210Ω	.6Ω	12C-19009-1	A-3332 ①	A-3025	RO-2 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	VIKING PART No.	QUAM PART No.	
SP1	FIELD PM	V. C. IMP. 4.2Ω	18A-19896	57J9	57A1	
SP2	CONE DIA. 5"X7"	V. C. DIA. 9/16"				

R F COILS

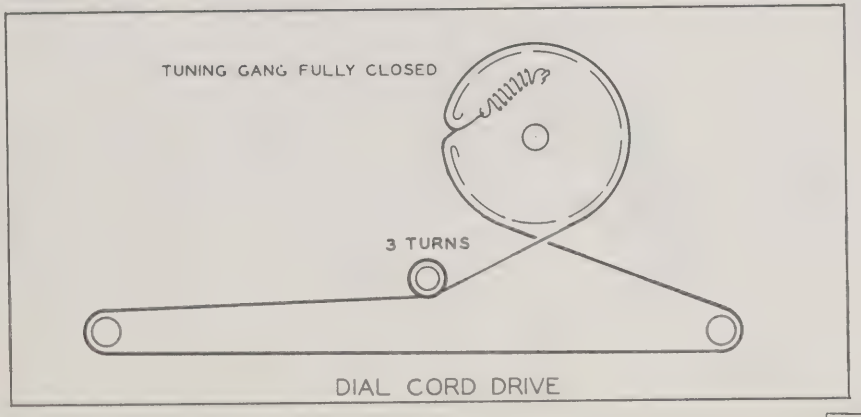
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.5Ω		13E-19830		
L2	Osc. Coil	.9Ω	6.8Ω	13D-19064		
L3	1st IF	18Ω	18Ω	13B-17731		
L4	2nd IF	18Ω	18Ω	12B-17731		

SELENIUM RECTIFIER

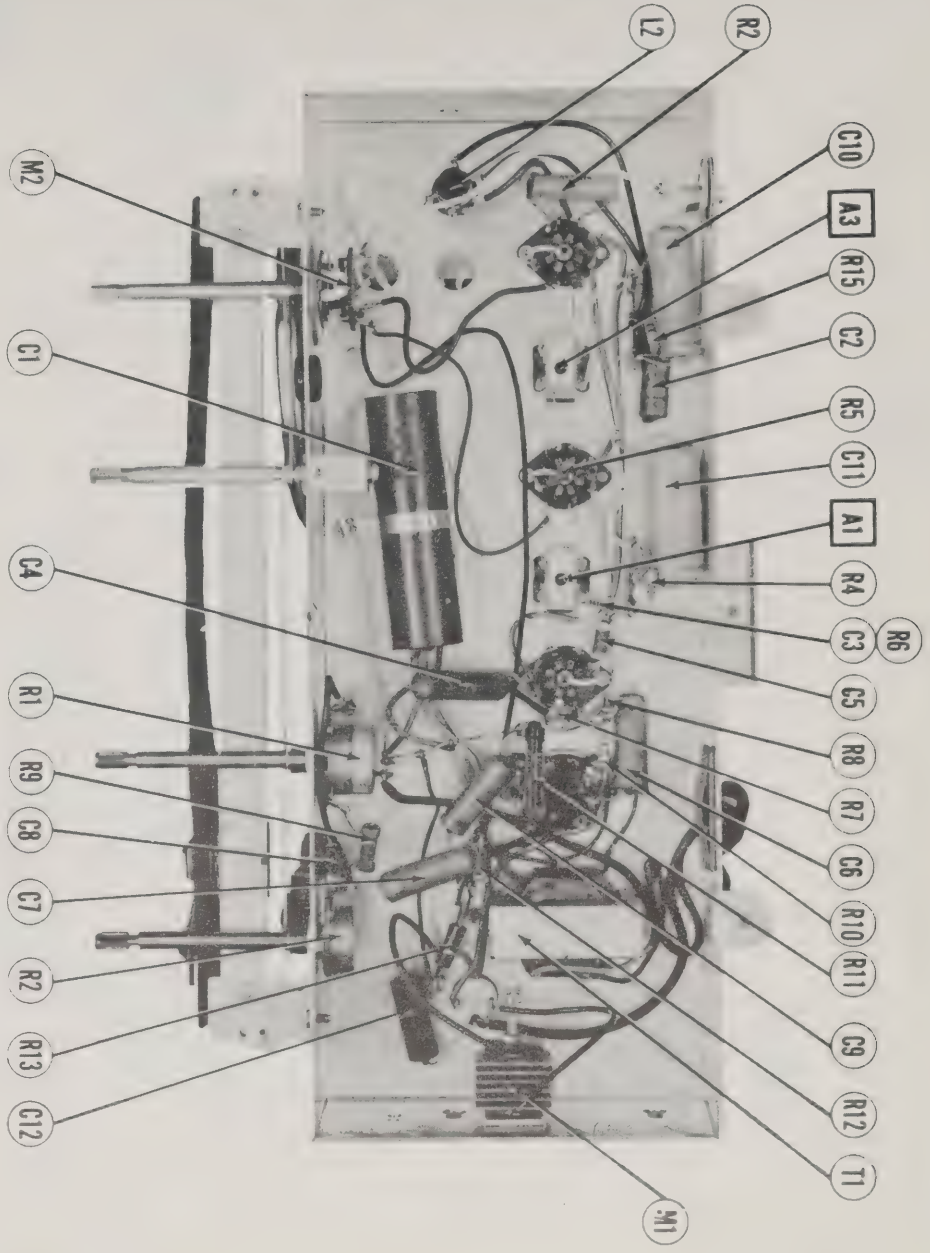
ITEM No.	RATING	REPLACEMENT DATA			NOTES
	CURRENT	AIRLINE PART No.	SYLVANIA PART No.	SELETRON PART No.	
M1	.058A	21J-19594	NC-5	5M1	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M2	Switch	20A-19660	Radio-Phono
M3	2 Gang Var. Cap.	8A-18997	(42-490MMF, 25-158MMF)
	Dial Pointer	2G-18119	
	Dial Scale	2M-19777	
	Knob	5B-11131-74	Plain
	Knob	5B-16057-74	With Dot



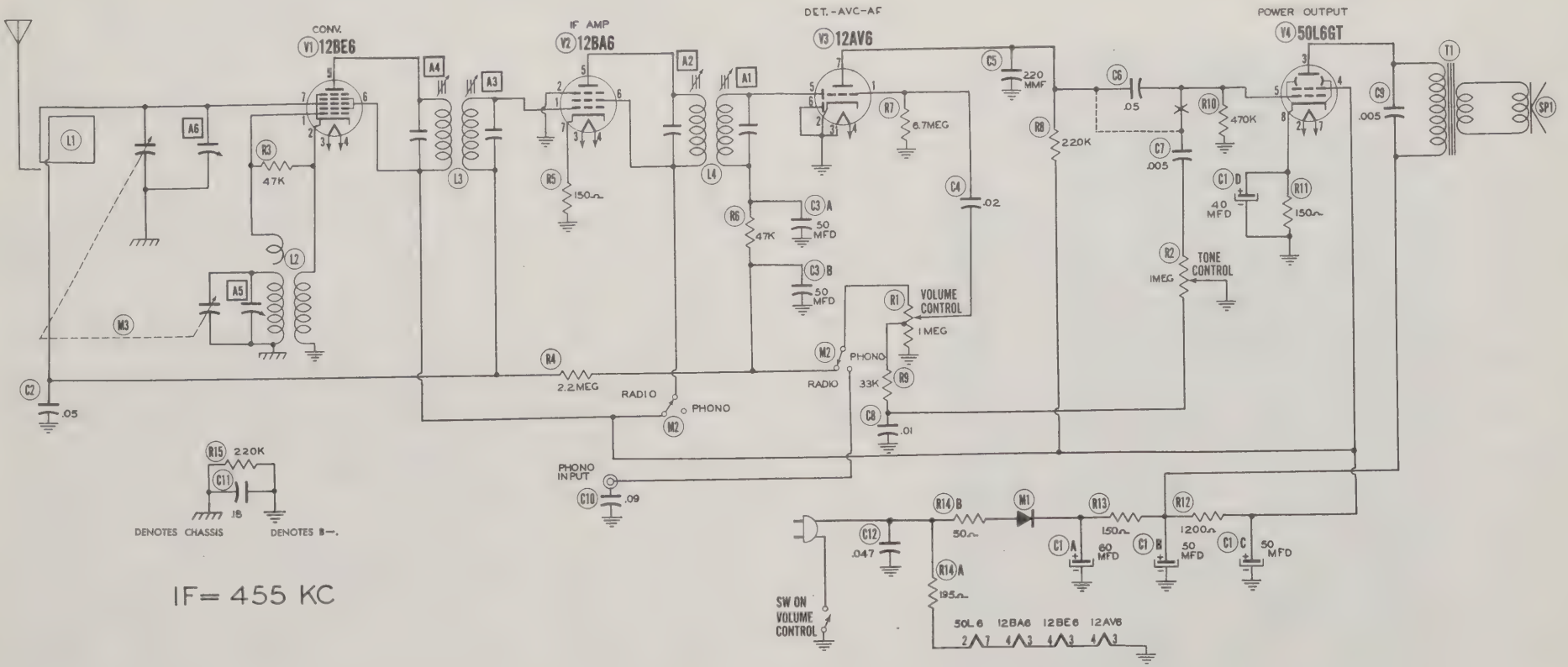
CHASSIS—BOTTOM VIEW



SET 143 FOLDER 3

AIRLINE MODEL 15BR-1547A

AIRLINE MODEL 15BR-1547A



IF= 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	§-5.2VDC	0V	12VAC	24VAC	85VDC	85VDC	-.1VDC	
V 2	12BA6	-.1VDC	0V	24VAC	35VAC	85VDC	85VDC	1.4VDC	
V 3	12AV6	-.3VDC	0V	0V	12VAC	-.2VDC	0V	53VDC	
V 4	50L6GT	0V		35VAC	100VDC	85VDC	0V	80VAC	5.8VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12BE6	47KΩ	.9Ω	12Ω	24Ω	†1.3KΩ	†1.3KΩ	3.2Meg	
V 2	12BA6	3.2Meg	0Ω	24Ω	36Ω	†1.3KΩ	†1.3KΩ	150Ω	
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†250KΩ	
V 4	50L6GT	Inf.		36Ω	†350Ω	1.3KΩ	470KΩ	Inf.	115Ω	150Ω

† MEASURED FROM JUNCTION OF M1 AND R13.

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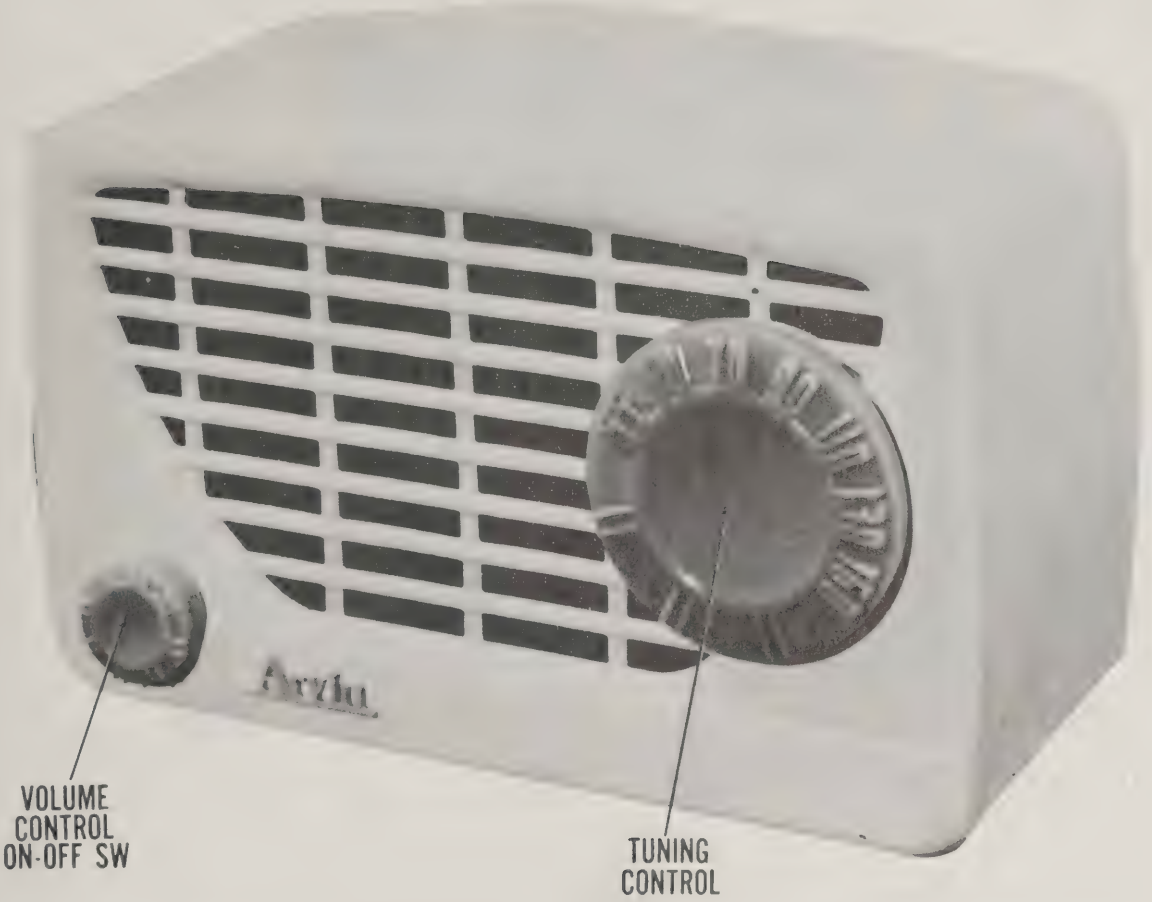
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

ARVIN
MODEL 540T (Ch. RE-278)

ARVIN
MODEL 540T (Ch. RE-278)



ARVIN
MODEL 540T (Ch. RE-278)

TRADE NAME	Arvin, Model 540T (Ch. RE-278)
MANUFACTURER	Arvin Industries, Inc., Columbus, Indiana
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna.
TUBES(FOUR)	Types 12SA7 Converter, 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05Mfd.	High side to stator on rear section of tuning gang. Low side to B-	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	50MMF	High side to Ant. terminal on ant. coil. (Remove hank ant.). Low side to B-.	1620KC	"	"	A3	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

ARVIN MODEL 540T

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7GT	12SA7GT	8AD	
V2	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
V3	Power Output	50L6GT	50L6GT	7AC	
V4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	A22876	PRS150/40-20-20		EDL4215C		TVA-3432	Filter
B	20	150							Filter
C	20	25							Output Cathode
C2	.05	200	C20067-503	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C3	100	500	C20065-101	1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Diode RF Filter
C4	.002	600	C20069-202	P688-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Coupling
C5A	.01		♦	P688-01	♦PC-80	PTE6S1	GP2-333-103	6TM-S1	Audio Coupling †
B	250			SI250		5W5T25	GP2K-251		AF Amp. Plate ‡
C									Output Grid *
C6	.01	400	C20068-103	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Output Plate
C7	.05	400	C20068-503	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter
C8	.05	400	C20068-503	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

* Not used in all models.
† Some models use .002MFD in this application (Mfgrs. Part No. C20069-202).
‡ Some models use 100MMF in this application (Mfgrs. Part No. C20065-101).
♦ Items C5A, C5B, C5C, R5A, R5B are combined in one unit.
When replacing items seperately, C5B, C5C should total 250MMF.

CONTROLS

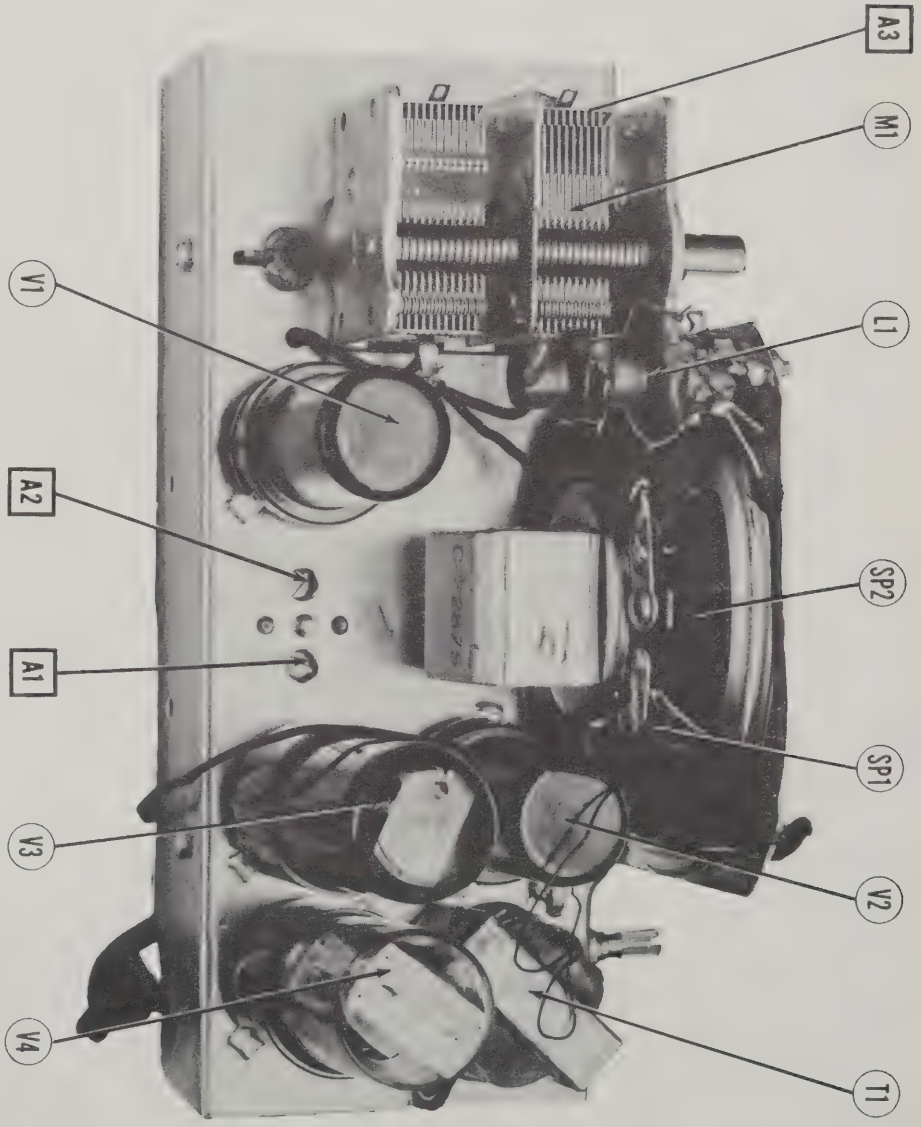
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	2Meg	½	C23068	Q13-139	AG-66-Z		Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3		Attach to R1A Per Instructions
C	Switch		Not Req.	76-1	SW-B		Attach to R1A Per Instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	C20060-223	BTS-22K	Osc. Grid
R3	4.7Meg	½	C20060-475	BTS-4.7Meg	AVC Network
R4	15Meg	½	C20060-156	BTS-15Meg	AF Amp. Grid
R5A	500KΩ	½	♦	BTS-470K	AF Amp. Plate
R5B	500KΩ	½	♦	BTS-470K	Output Grid-See Note
R6	120Ω	½	C20120-121	BTS-120	Output Cathode
R7	2200Ω	1	C20070-222	BTA-2200	Filter
R8	15Ω	½	C20060-150		Surge Limiter
R9	47Ω	1	A19177	BW-1-47	Filament Dropping

♦ Items R5A, R5B, C5A, C5B and C5C are combined into one unit in some models.
Note- Some models use 1Meg resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ARVIN	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T1	1.9KΩ	3.5Ω	160Ω	.4Ω	C22878	A-3332 ①	A-2928 ①	RO-2 ①	① Bend mounting tabs down, file out slots and mount in original holes on chassis.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V. C. IMP.		ST113		
SP1	PM	3.5Ω	C-22875	Mod. P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

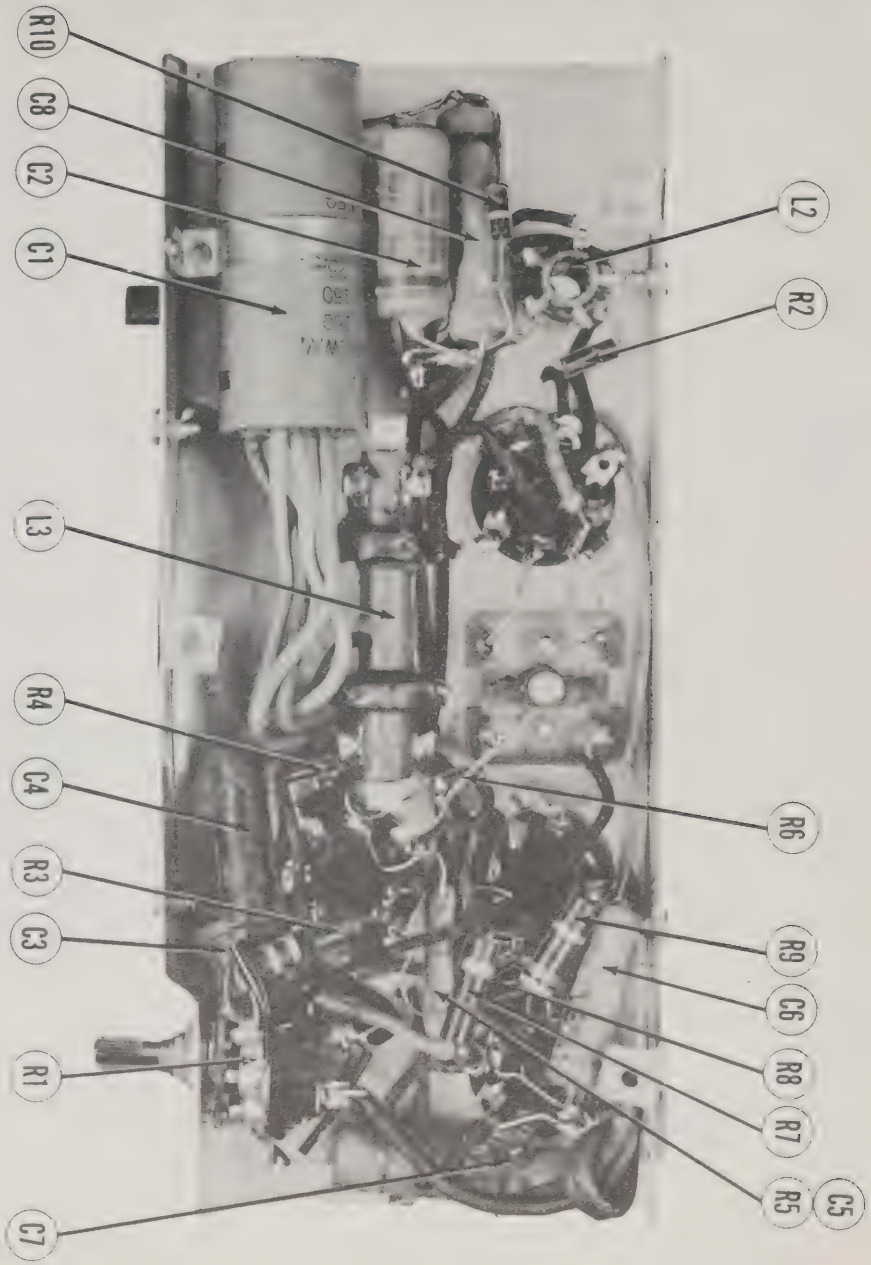
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	
L1	Ant. Coil	34Ω	3Ω	C22864	14-1071	
L2	Osc. Coil	.9Ω	7Ω	C22865-1	14-1073	
L3	IF Trans.	27Ω	16Ω	C22863-1		

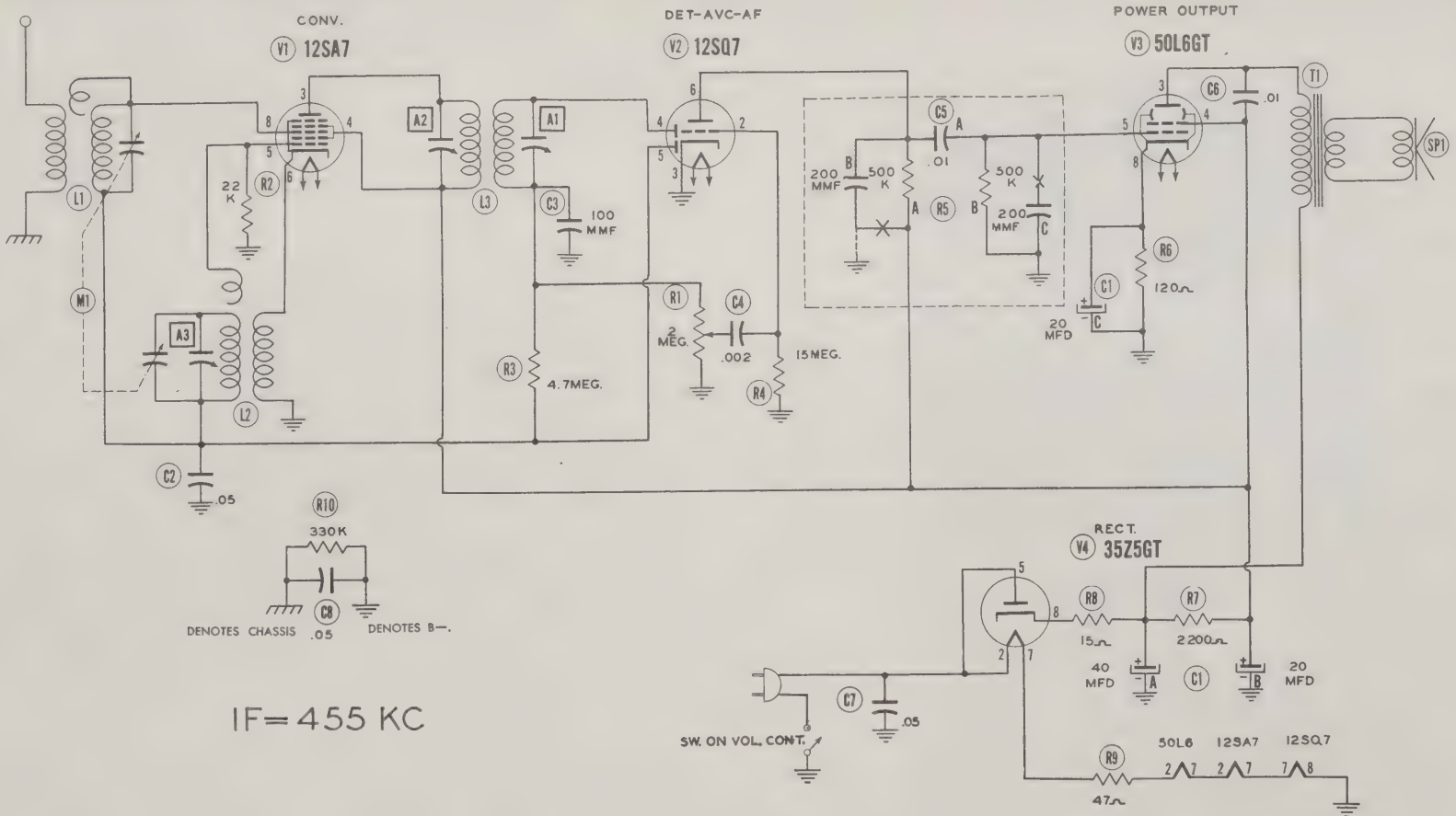
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	2 Gang Var. Cap.	C22919	(11-377MMF, 36-214MMF)
	Cabinet	E24328-1	Ivory
	Cabinet	E24328-8	Citron
	Cabinet	E24328-7	Flame
	Cabinet	E24328-9	Cherry
	Cabinet	E24328-10	Green
	Cabinet	E24328-11	Pebble
	Knob	A24330-1	Volume
	Knob	C24331-1	Dial

CHASSIS—BOTTOM VIEW



ARVIN MODEL 540T



IF=455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	0V	24VAC	90VDC	90VDC	§-6VDC	0V	12VAC	-.4VDC
V 2	12SQ7GT	0V	-.4VDC	0V	-.2VDC	-.3VDC	52VDC	12VAC	0V
V 3	50L6GT	0V	74VAC	115VDC	90VDC	0V	0V	24VAC	5.8VDC
V 4	35Z5GT	0V	117VAC	108VAC	0V	117VAC	120VDC	80VAC	120VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7GT	330KΩ	25Ω	†2.2KΩ	2.2KΩ	22KΩ	.9Ω	12Ω	7Meg
V 2	12SQ7GT	330KΩ	15Meg	0Ω	2Meg	7Meg	†470KΩ	12Ω	0Ω
V 3	50L6GT	Inf.	75Ω	†180Ω	†2.2KΩ	470KΩ	Inf.	25Ω	120Ω
V 4	35Z5GT	Inf.	160Ω	150Ω	Inf.	160Ω	20KΩ	115Ω	20KΩ

† MEASURED FROM PIN 8 OF V4.

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

AUTOMATIC
MODELS TV-1649, TV-1650, TV-1651

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MODEL TV-1649

AUTOMATIC
MODELS TV-1649, TV-1650, TV-1651

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DATE 9-51 SET 143 FOLDER 5

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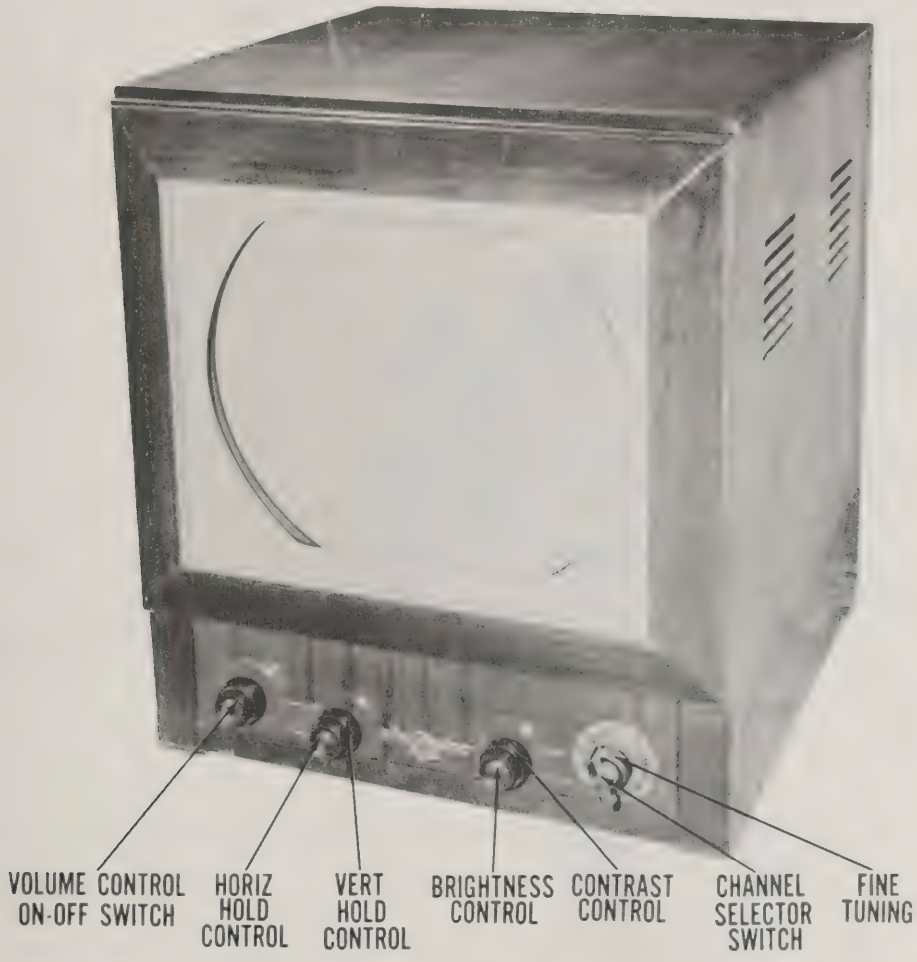
AUTOMATIC
MODELS TV-1649, TV-1650, TV-1651



AUTOMATIC MODEL TV-1649

TRADE NAME	Automatic, Models TV-1649, TV-1650, TV-1651 (Series A and B)
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Television Receiver
TUBES	Twenty-four
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.1 Amp. at 117 Volts AC
TUNING RANGE—CHANNELS	2 thru 13

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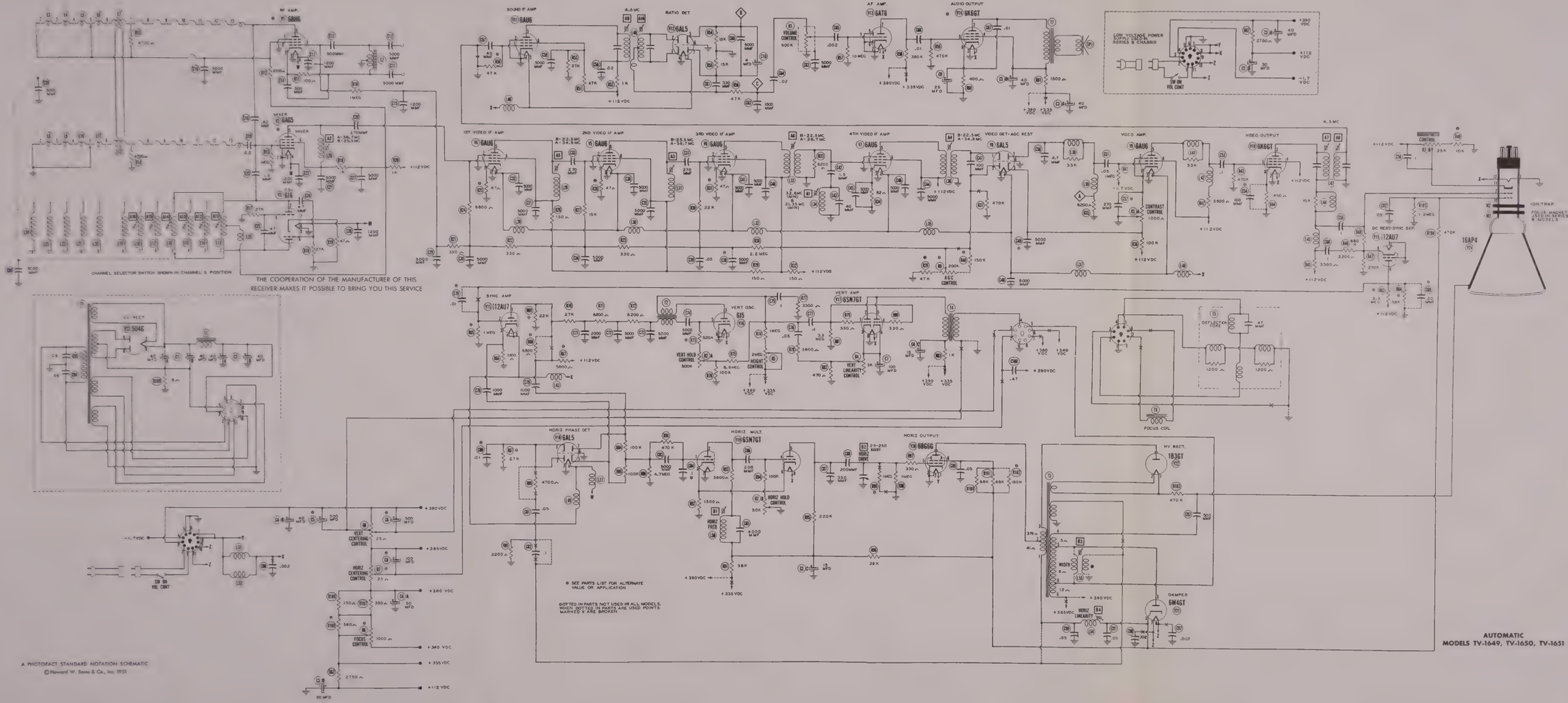
DATE 9-51 SET 143 FOLDER 5

AUTOMATIC
MODELS TV-1649, TV-1650, TV-1651



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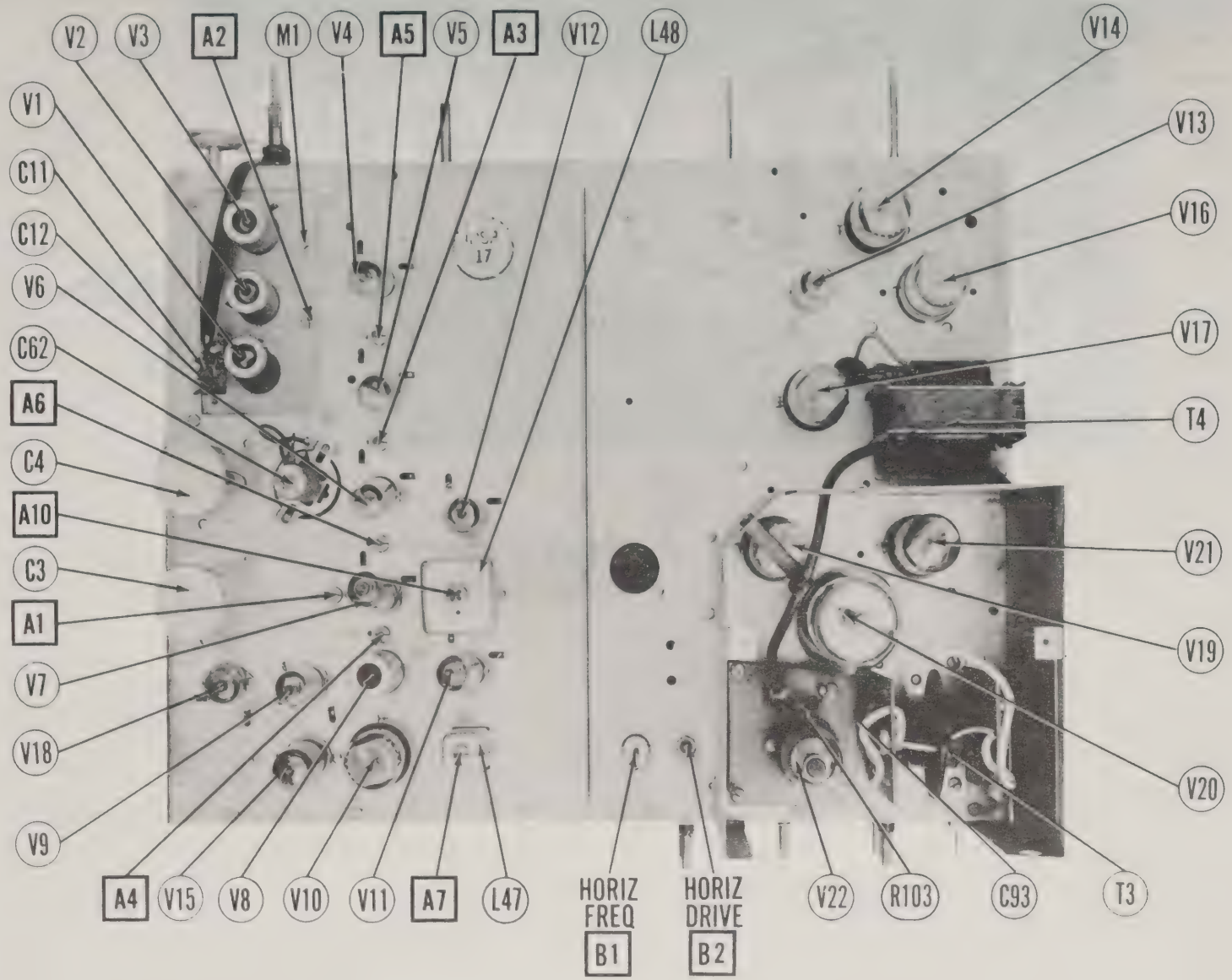
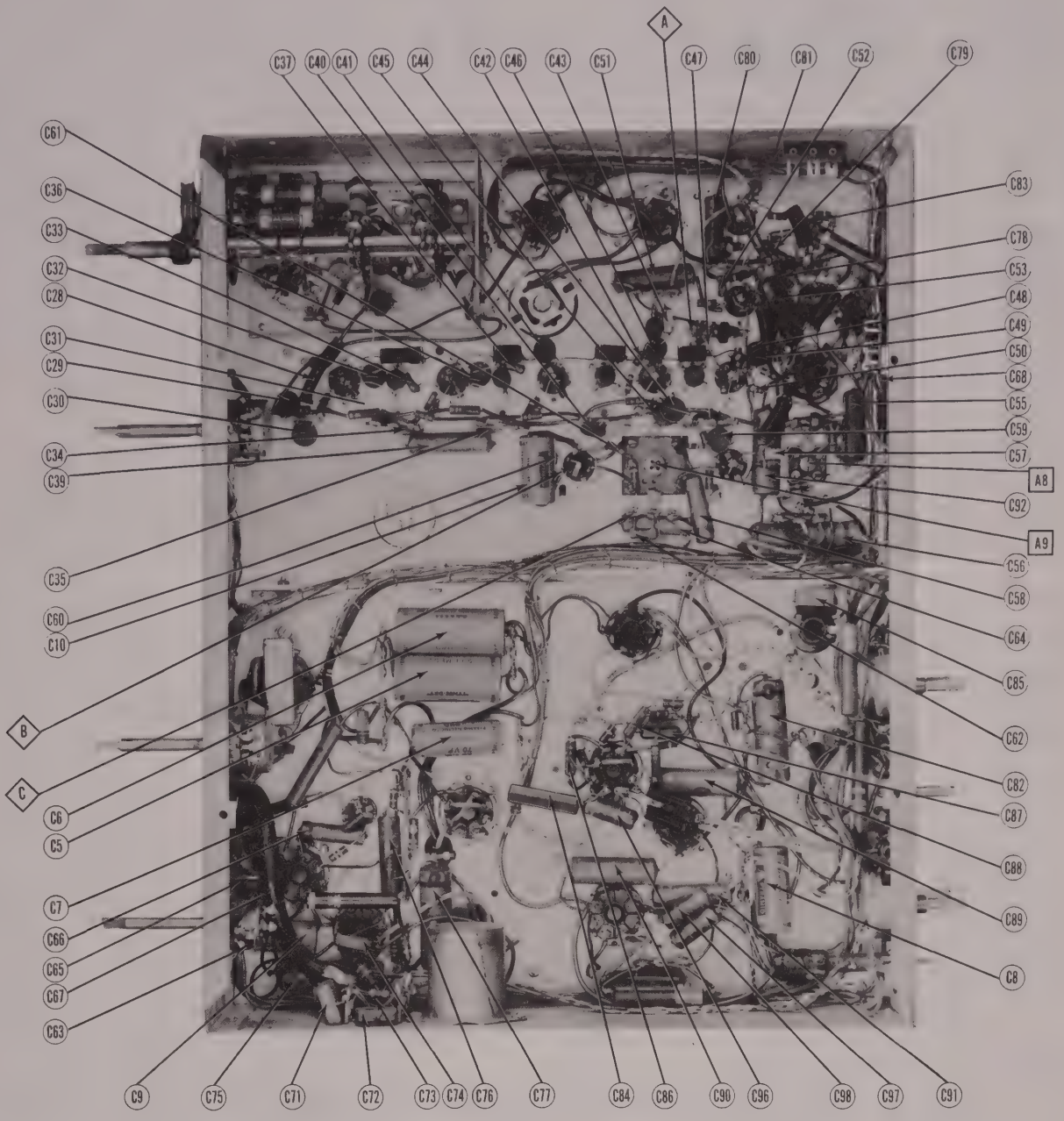


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

The chassis for the model 1649 series A, have video IF frequencies different from those in the model 1649 series B. The alignment frequencies will be designated in the table by A, for series A and B, for series B. Determine which set is to be aligned and proceed accordingly. If the set has a three tube tuner, remove the local oscillator tube, (V3). If the set has a two tube tuner, remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed. These alterations will disable the local oscillator and prevent the possibility of erroneous indications. Connect the negative lead of a 3 volt battery to the ungrounded lead of C39, connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over mixer or dummy converter tube. Low side to chassis.	(A)32.6MC (B)21.35MC (Unmod.)	Any	DC Probe to point A. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	(A)36.7MC (B)25.5MC	"	"	A2, A3, A4	Adjust for maximum deflection.
3.	"	"	(A)34.8MC (B)22.5MC	"	"	A5, A6	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to an ungrounded tube shield floating over mixer, (or dummy converter), tube. Low side to chassis.	A-34MC B-24MC (10MCSWP)	A {32.4MC 36.9MC B {21.25MC 25.75MC	Any	Vert. amp. to point A. Low side to chassis.		Check for response curve similar to fig. 1A, or fig. 1B. If necessary retouch A2 thru A6 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01Mfd.	High side to pin 5 (grid) of 6K6, (V10). Low side to chassis.	4.5MC (400∿Mod.)	Any	DC Probe to point B. Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
6.	"	"	"	"	DC Probe to point C. Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01Mfd.	High side to pin 5, (grid) of 6K6, (V10). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. amp. to point B. Low side to chassis.	A7, A8, A9	Disconnect stabilizer capacitor, C10. Adjust for maximum amplitude and symmetry as per fig. 2.
6.	"	"	"	"	"	Vert. amp. to point C. Low side to chassis.	A10	Reconnect capacitor C10. Adjust A10 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A9 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT (THREE-TUBE TUNER)

Replace the local oscillator tube in its socket.
Since all other oscillator coils are connected in parallel with the channel 2 coil, it is essential that channel 2 be aligned first. The order of the remaining adjustments is not important.
The sweep generator output lead should be terminated with its characteristic imdedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC SWP)	55.25MC 59.75MC	2	Vert. Amp. to Point A. Low side to chassis.	A11	Adjust to place video marker at 50% as shown in figure 4.
			63MC (10MC SWP)	61.25MC 65.75MC	3		A12	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A13	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A14	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A15	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A16	
8.	"	"	183MC (10MC SWP)	181.25MC 185.75MC	8		L19	Expand or compress coil turn to place video marker at 50% as per figure 4.
			189MC (10MC SWP)	187.25MC 191.75MC	9		L20	
			195MC (10MC SWP)	193.25MC 197.75MC	10		L21	
			201MC (10MC SWP)	199.25MC 203.75MC	11		L22	
			207MC (10MC SWP)	205.25MC 209.75MC	12		L23	
			213MC (10MC SWP)	211.25MC 215.75MC	13		L24	

THE RF AND MIXER PORTION OF THIS RECEIVER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

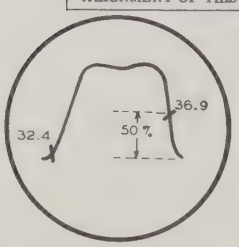


FIG. 1A

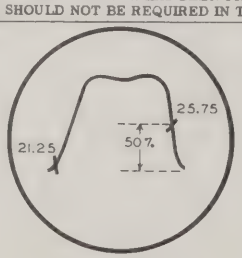


FIG. 1B

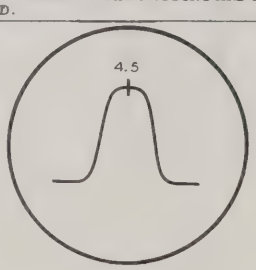


FIG. 2

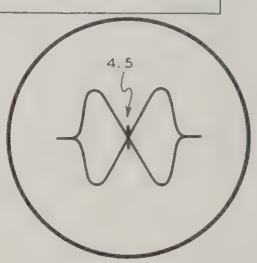


FIG. 3

ALIGNMENT INSTRUCTIONS (CONT.)

OSCILLATOR ALIGNMENT (TWO-TUBE TUNER)

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A17. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A17 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MCSWP)	211.25MC 215.75MC	13	Vert. Amp. to point A. Low side to chassis.	A18	Adjust to place video marker at 50% as shown in fig. 4.
			207MC (10MCSWP)	205.25MC 209.75MC	12		A19	
			201MC (10MCSWP)	199.25MC 203.75MC	11		A20	
			195MC (10MCSWP)	193.25MC 197.75MC	10		A21	
			189MC (10MCSWP)	187.25MC 191.75MC	9		A22	
			183MC (10MCSWP)	181.25MC 185.75MC	8		A23	
			177MC (10MCSWP)	175.25MC 179.75MC	7		A24	
			85MC (10MCSWP)	83.25MC 87.75MC	6		A25	
			79MC (10MCSWP)	77.25MC 81.75MC	5		A26	
			69MC (10MCSWP)	67.25MC 71.75MC	4		A27	
			63MC (10MCSWP)	61.25MC 65.75MC	3		A28	
			57MC (10MCSWP)	55.25MC 59.75MC	2		A29	

THE RF AND MIXER PORTION OF THIS TUNER HAS BEEN PROPERLY ALIGNED AT THE FACTORY AND IS VERY STABLE. ALIGNMENT OF THIS PORTION SHOULD NOT BE REQUIRED IN THE FIELD.

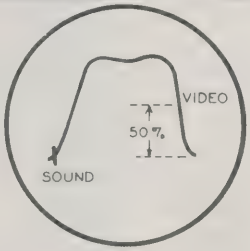


FIG. 4

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	-.1VDC	.2VDC	0V	6VAC	95VDC	95VDC	0V		
V 2	6AG5	-1.3VDC	0V	0V	6VAC	95VDC	95VDC	0V		
V 3	6J6	85VDC	85VDC	0V	6VAC	§-1.5VDC	§-1.6VDC	0V		
V 4	6AU6	-1.8VDC	0V	0V	6VAC	105VDC	105VDC	.3VDC		
V 5	6AU6	-.3VDC	0V	0V	6VAC	105VDC	105VDC	.3VDC		
V 6	6AU6	-.3VDC	0V	0V	6VAC	108VDC	108VDC	.3VDC		
V 7	6AU6	0V	0V	0V	6VAC	110VDC	110VDC	.7VDC		
V 8	6AL5	0V	-1VDC	0V	6VAC	0V	0V	-.2VDC		
V 9	6AU6	-.1VDC	.9VDC	0V	6VAC	105VDC	112VDC	.9VDC		
V 10	6K6GT	0V	0V	70VDC	112VDC	.3VDC	0V	6.1VAC	7.8VDC	
V 11	6AU6	-.5VDC	0V	6.1VAC	0V	110VDC	34VDC	0V		
V 12	6AL5	0V	0V	6.1VAC	0V	.2VDC	0V	-.3VDC		
V 13	6AT6	-.4VDC	0V	0V	6.2VAC	0V	0V	60VDC		
V 14	6K6GT	0V	0V	250VDC	260VDC	0V	330VDC	6.2VAC	17VDC	
V 15	12AU7	63VDC	19VDC	21VDC	6VAC	6VAC	19VDC	0V	0V	0V
V 16	6J5	0V	0V	50VDC 105VDC	60VDC	-5VDC	0V	6.2VAC	0V	
V 17	6SN7GT	0V	300VDC	8VDC 16VDC	0V	300VDC	8VDC 16VDC	6.2VAC	0V	
V 18	6AL5	0V	0V	0V	6VAC	4.2VDC	0V	-2.5VDC		
V 19	6SN7GT	.3VDC	250VDC	10VDC	-4VDC	120VDC	10VDC	0V	6.2VAC	
V 20	6BG6G	0V	0V	0V	0V	-13VDC	0V	6.3VAC	290VDC	Top Cap *
V 21	6W4GT	290VDC	0V	550VDC	0V	380VDC	550VDC	¶	¶	
V 22	1B3GT	* DO NOT MEASURE.								
V 23	5U4G	0V	395VDC	0V	390VAC	0V	390VAC	0V	395VDC	
V 24	16AP4	0V	.5VDC	Pin 10 400VDC	Pin 11 110VDC	Pin 12 6.1VAC				

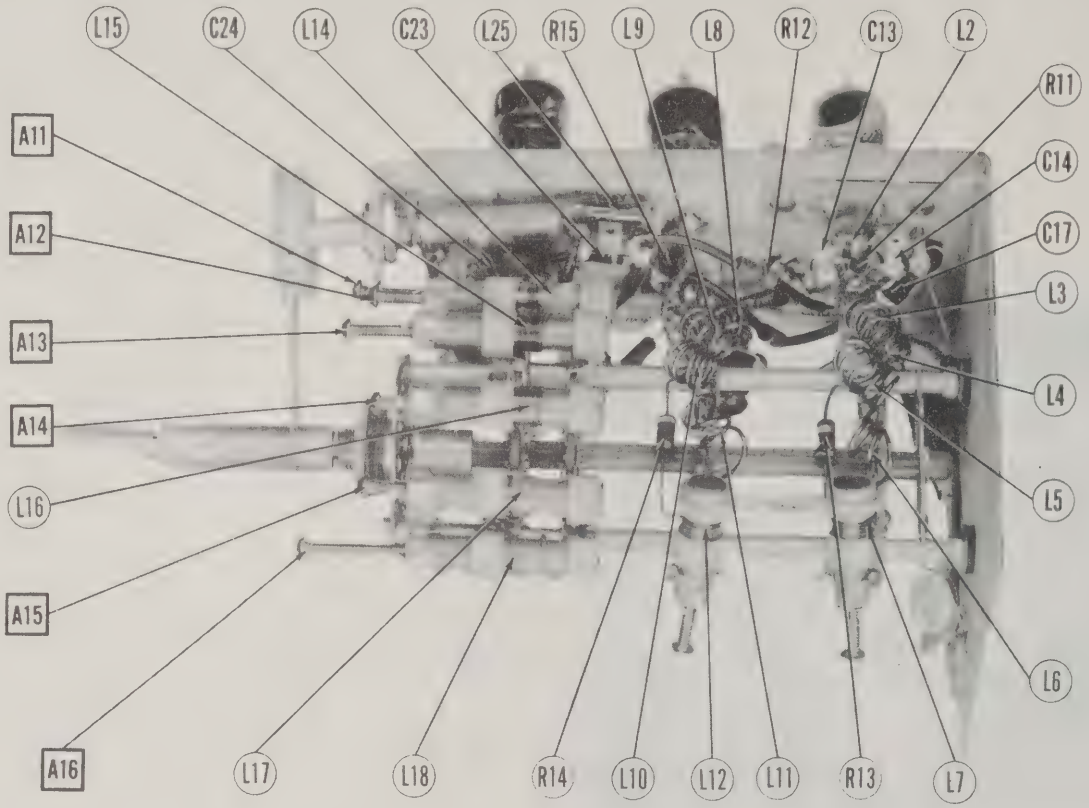
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
* DO NOT MEASURE
§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

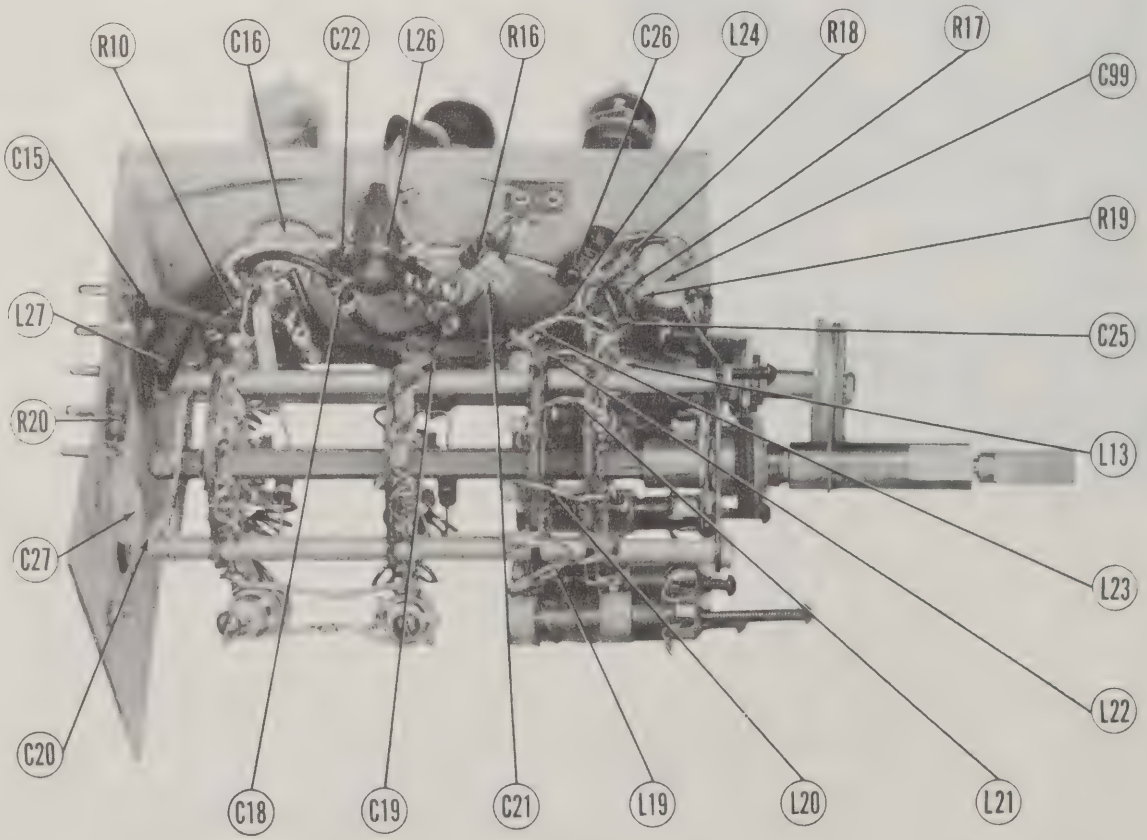
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BH6	4Meg	100Ω	0Ω	.1Ω	†5.3KΩ	†5.3KΩ	0Ω		
V 2	6AG5	1Meg	0Ω	0Ω	.1Ω	†5KΩ	†5KΩ	0Ω		
V 3	6J6	†4.5KΩ	†4.5KΩ	0Ω	.1Ω	27KΩ	27KΩ	52Ω		
V 4	6AU6	3.5Meg	0Ω	0Ω	.1Ω	†3.8KΩ	†3.8KΩ	50Ω		
V 5	6AU6	3.5Meg	0Ω	0Ω	.1Ω	†3.7KΩ	†3.7KΩ	47Ω		
V 6	6AU6	3.5Meg	0Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	47Ω		
V 7	6AU6	.1Ω	0Ω	0Ω	.1Ω	†3.2KΩ	†3.2KΩ	85Ω		
V 8	6AL5	.1Ω	500KΩ	0Ω	.1Ω	0Ω	0Ω	8.2KΩ		
V 9	6AU6	1.3Meg	1KΩ	0Ω	.1Ω	†10KΩ	†3.2KΩ	1KΩ		
V 10	6K6GT	Inf.	0Ω	†7KΩ	†3.2KΩ	500KΩ	Inf.	.1Ω	450Ω	
V 11	6AU6	50KΩ	0Ω	.1Ω	0Ω	†4.5KΩ	†28KΩ	0Ω		
V 12	6AL5	Inf.	Inf.	.1Ω	0Ω	15KΩ	0Ω	15KΩ		
V 13	6AT6	10Meg	0Ω	0Ω	.1Ω	0Ω	0Ω	†400K		
V 14	6K6GT	Inf.	0Ω	†2.2KΩ	†1.9KΩ	500KΩ	†360Ω	.1Ω	400Ω	
V 15	12AU7	†7.5KΩ	4Meg	4KΩ	.1Ω	.1Ω	†3.3Meg	0Ω	270KΩ	0Ω
V 16	6J5	Inf.	0Ω	†2.5Meg †1.2Meg	60KΩ	1.5Meg	3.3KΩ	.1Ω	0Ω	
V 17	6SN7GT	3.3Meg	†1.9KΩ	5.4KΩ 470Ω	3.3Meg	†1.9KΩ	5.4KΩ 470Ω	.1Ω	0Ω	
V 18	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.7Meg	0Ω	4.7Meg		
V 19	6SN7GT	4.7Meg	†42KΩ	1.5KΩ	150KΩ	†270KΩ	1.5KΩ	0Ω	.1Ω	
V 20	6BG6G	Inf.	0Ω	0Ω	Inf.	650KΩ	Inf.	.1Ω	†120KΩ	Top Cap ▲140Ω
V 21	6W4GT	50KΩ	Inf.	90KΩ	Inf.	†60Ω	90KΩ	Inf.	Inf.	
V 22	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Top Cap ▲540Ω
V 23	5U4G	Inf.	15KΩ	Inf.	30Ω	Inf.	32Ω	Inf.	15KΩ	
V 24	16AP4	0Ω	1Meg	Pin 10 ▲420KΩ	Pin 11 12KΩ	Pin 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
† MEASURED FROM PIN 8 OF V23.
▲ MEASURED FROM PIN 3 OF V21.

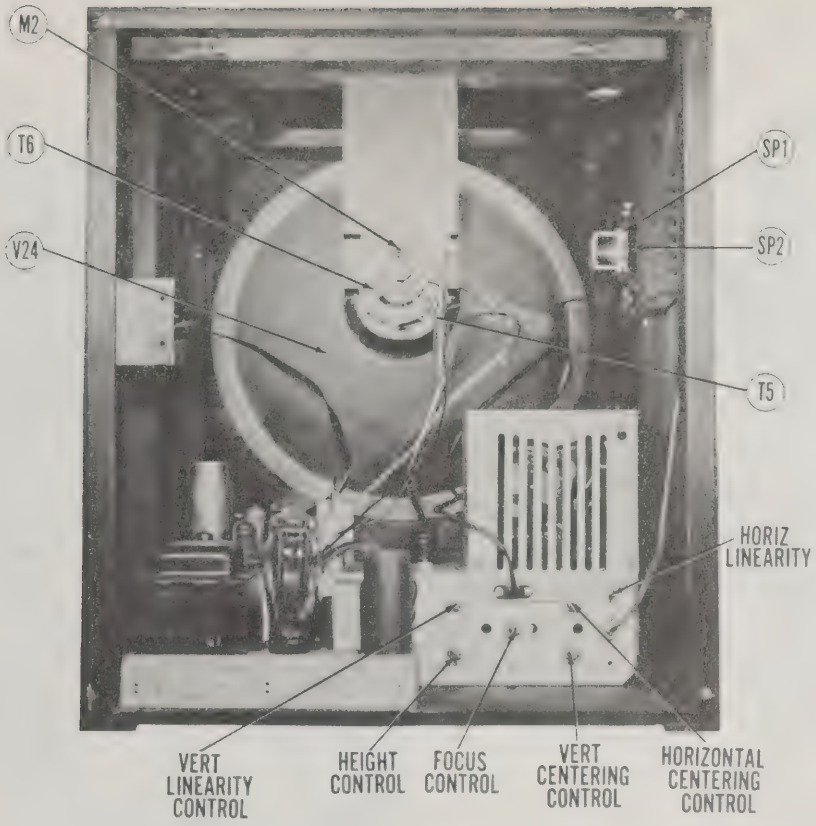
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

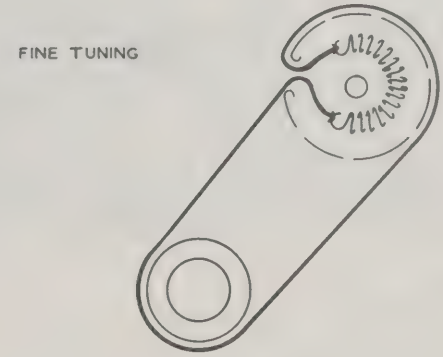
Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), to the center of the range over which the picture synchronizes horizontally.

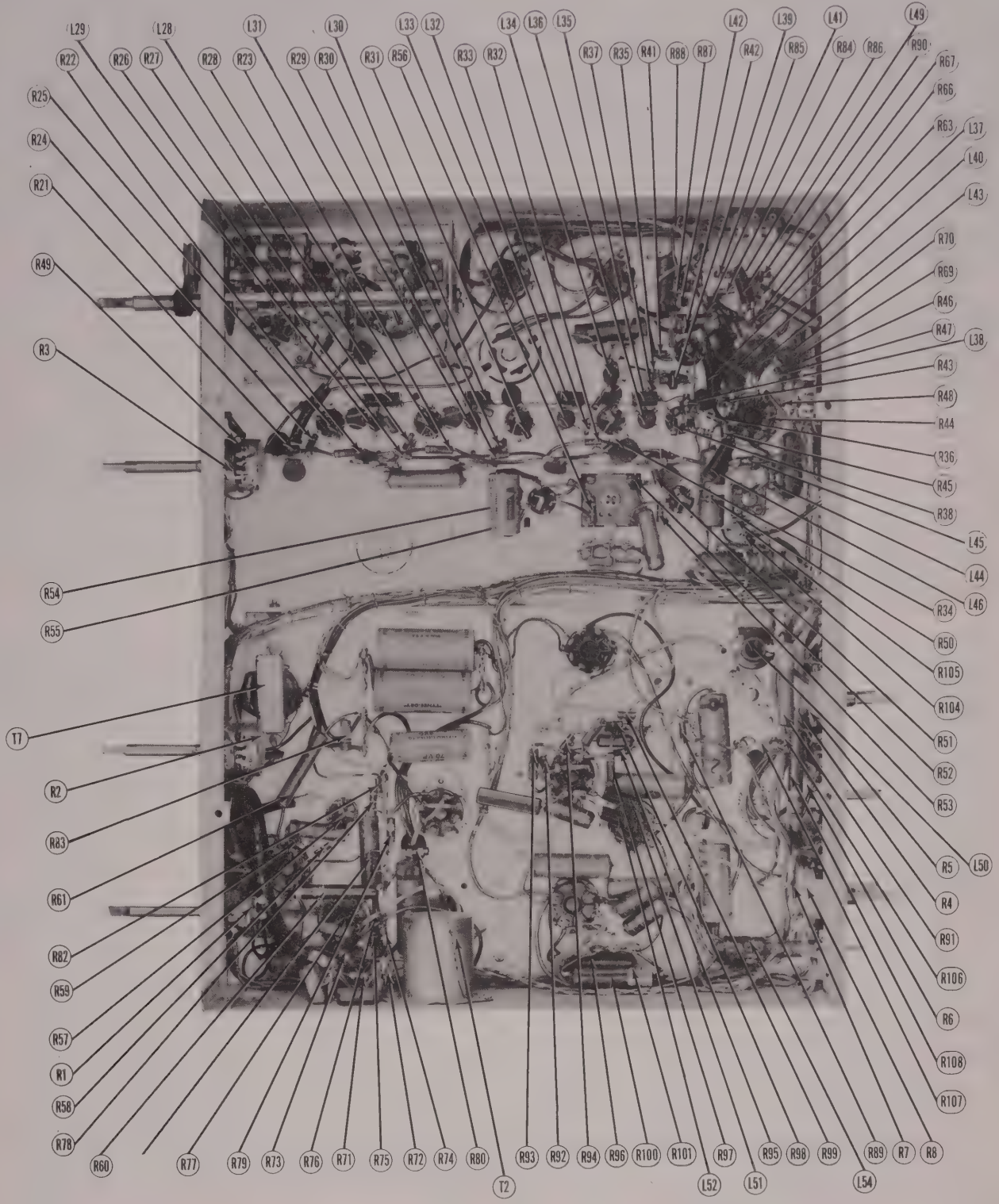
Adjust the horizontal drive trimmer, (B2), clockwise as far as possible without crowding or beaded lines appearing in the picture.

If the set has a width slug, (B3), adjust it until the picture is slightly wider than necessary to fill the mask horizontally.

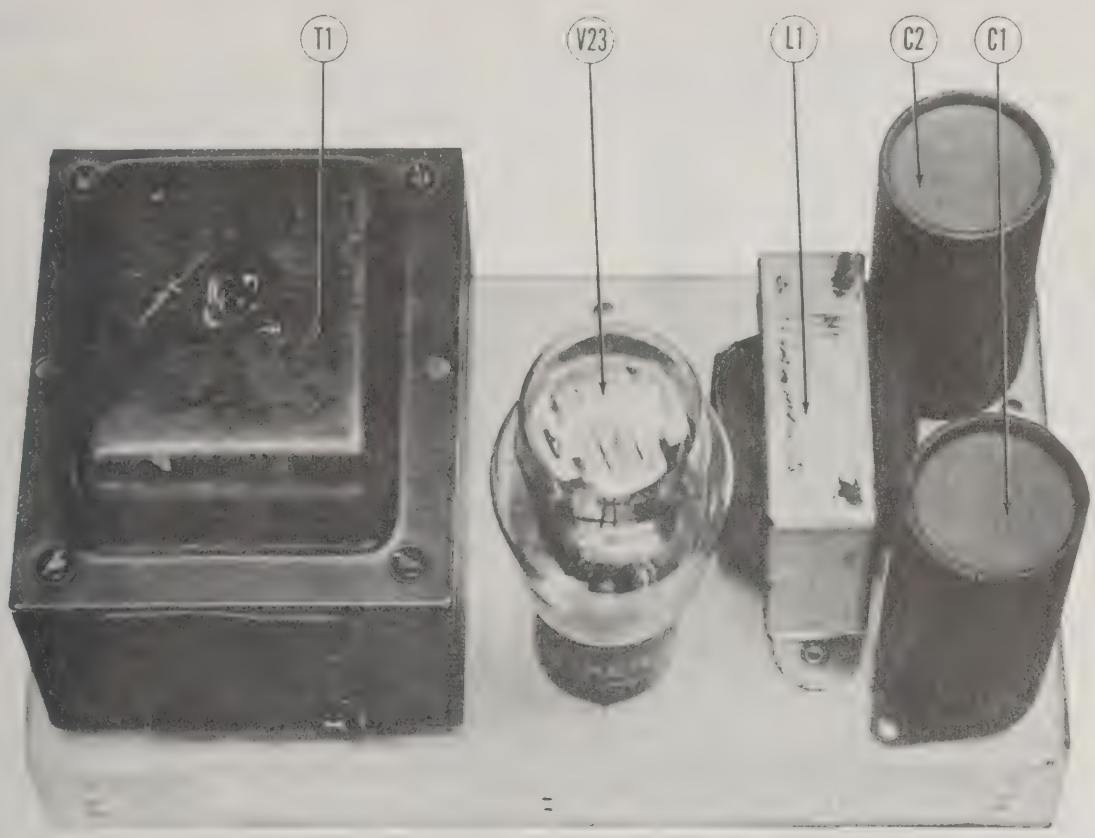
Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right. Readjustment of B2 may be necessary to obtain optimum results.



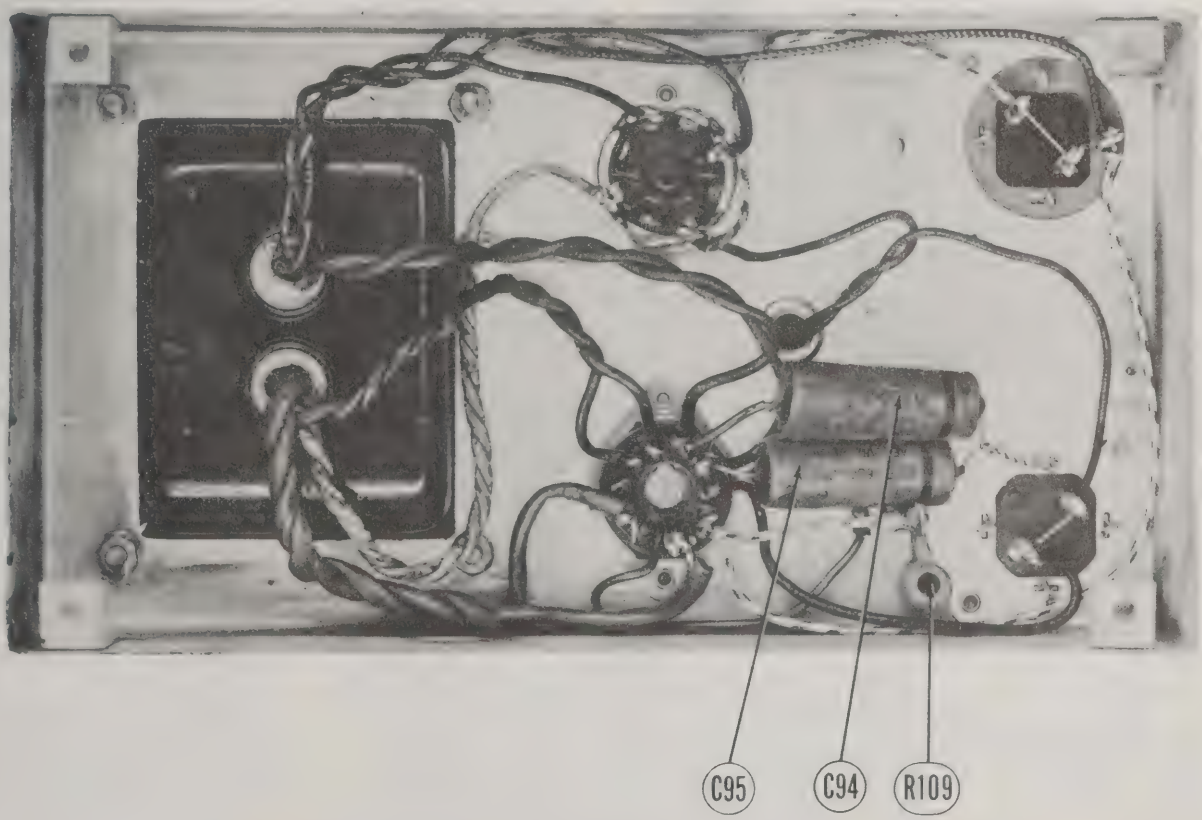
FINE TUNING DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



POWER SUPPLY CHASSIS-TOP VIEW



POWER SUPPLY CHASSIS-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AUTOMATIC Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6BH6	6BH6	7CM	
B	RF Amplifier	6AG5	6AG5	7BD	
V2A	Mixer	6AG5	6AG5	7BD	
B	Converter	6J6	6J6	7BF	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF Amp.	6AU6	6AU6	7BK	
V5	2nd Video IF Amp	6AU6	6AU6	7BK	
V6	3rd Video IF Amp	6AU6	6AU6	7BK	
V7	4th Video IF Amp	6AU6	6AU6	7BK	
V8	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V9	Video Amplifier	6AU6	6AU6	7BK	
V10	Video Output	6K6GT	6K6GT	7S	
V11	Sound IF Amp.	6AU6	6AU6	7BK	
V12	Ratio Detector	6AL5	6AL5	6BT	
V13	AF Amplifier	6AT6	6AT6	7BT	
V14A	Audio Output	6K6GT	6K6GT	7S	
B	Audio Output	6V6GT	6V6GT	7AC	
V15	Sync Amp - Sync. Sep - DC Restorer	12AU7	12AU7	9A	
V16	Vert Oscillator	6J5	6J5	6Q	
V17	Vert Amplifier	6SN7GT	6SN7GT	8BD	
V18	Horiz. Phase Det	6AL5	6AL5	6BT	
V19	Horiz Multi	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BG6G	6BG6G	5BT	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AUTOMATIC Part No	SYLVANIA Part No.	THOMAS Part No.	RTMA BASE TYPE	NOTES
V24	16AP4	16AP4A	16CP4A (Glass Equivalent)	12D	② Outer coating must be grounded. ③ High voltage connector must be changed. ④ Use single magnet ion trap.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUTOMATIC Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	SPRAGUE Part No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH2-55		UPT4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C2A	40	450		AFH2-55		UPT4445		TVL-2764	▲ Filter
B	40	450							▲ Filter
C3A	40	450				UPT46145		TVL-3785	▲ Decoupling
B	40	450				BR3025A		TVA-1510	■ Audio Output Dec.
C	15	450							▲ Horiz. MV Dec. Decoupling
D	30	300							
C4A	50	450				UPT84245		TVL-2770	▲ Filter
B	40	450						TVA-1108	■ Filter
C	15	450							▲ Vert. Amp. Dec.
C5	500	10		PRS12/500		BRH125A		TVA-1132	Vert. Cont. Cont. Bypass †
C6	500	10		PRS12/500		BRH125A		TVA-1132	Vert. Cont. Cont. Bypass †
C7	100	25		PRS25/100		BRH251A		TVA-1207	Vert. Output Cathode
C8	100	25		PRS25/100		BRH251A		TVA-1207	Horiz. Cont. Cont. Bypass †
C9	25	25		PRS25/25		BR252A		TVA-1205	Audio Output Cathode
C10	4	25		PRS150/4		BR550		TVA-1203	Stabilizing Cap.
C11	5000			BPD-005	DD-502		811-005	5HK-D5	RF Coupling
C12	5000			BPD-005	DD-502		811-005	5HK-D5	RF Coupling
C13	500			SI500	D6-501		GP2K-501	5GA-T5	RF Coupling
C14	500			SI500	D6-501		GP2K-501	5GA-T5	RF Amp. Cathode
C15	1200			SI1200	D6-122		GP2L-122	5HK-D5	AGC Filter
C16	5000			BPD-005	DD-502		811-005	5HK-D5	RF Amp. Decoupling
C17	1200			SI1200	D6-122		GP2L-122	5HK-D15	RF Amp. Fil.
C18	.82				TCZ-2.2		N90K-R82		RF Coupling
C19	2.2				TCZ-2.2		NP0K-2R2		RF Coupling
C20	5000			BPD-005	DD-502		811-005	5HK-D5	Switch Strut Isolation
C21	5000			BPD-005	DD-502		811-005	5HK-D5	Mixer Decoupling
C22	1200			SI1200	D6-122		GP2L-122	5HK-D15	Mixer Fil.
C23	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		Osc. Coupling
C24	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7		Osc. Grid Cap.
C25	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7		Osc. Grid Cap.
C26	1200			SI1200	D6-122		GP2L-122	5HK-D15	Osc. Fil.
C27	5000			BPD-005	DD-502		811-005	5HK-D5	RF Bypass
C28	270				TCN-270		N750L-271		IF Coupling
C29	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	AGC Filter
C30	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	AGC Filter
C31	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	1st. Video IF Dec.
C32	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	1st. Video IF Fil.
C33	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	IF Coupling
C34	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	AGC Filter
C35	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	2nd. Video IF Dec.
C36	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	2nd. Video IF Fil.
C37	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	IF Coupling
C38	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	AGC Filter *
C39	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AGC Filter
C40	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	3rd. Video IF Dec.
C41	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	3rd. Video IF Fil.
C42	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5		IF Coupling
C43	40						NP0K-400		Fixed Trimmer
C44	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	4th. Video IF Dec.
C45	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	4th. Video IF Cathode
C46	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	4th. Video IF Fil.
C47	100			SI100	D6-101	5W5T1	GP1K-101	5GA-T1	IF Coupling
C48	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	Video Det. Fil.
C49	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	AGC Filter †
C50	4.7			SI4.7NP0	TCZ-4.7		NP0K-4R7		Diode RF Filter
C51	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Video Coupling
C52	270			SI270	D6-271	5R5T3	GP2K-271	5GA-T27	Video Amp. Cathode *
C53	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C54	100			SI100	D6-101	5W5T1	GP1K-101	5GA-T1	Video Output Cathode *

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUTOMATIC Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	SPRAGUE Part No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C55	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C56	.1	600		P868-1	DF-104	PTE6P1		6TM-P1	Picture Tube Cathode
C57	40						NP0K-400		Sound IF Coupling
C58	.02	400		P488-02	DF-203	PTE4S1		4TM-S2	Sound IF Plate
C59	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	Sound IF Screen
C60	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	RF Bypass
C61	330			SI330	D6-331		GP2K-331	5GA-T33	RF Bypass
C62	1500			SI1500	D6-152	1W5D15	GP2L-152	5HK-D15	De-emphasis
C63	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	Volume Cont. Isolation
C64	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C65	.002	400		P868-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Audio Coupling
C66	.01	600		P868-01	D6-103	PTE6S1	GP2-333-502	6TM-S1	Audio Coupling
C67	.01	600		P868-01	D6-103	PTE6S1	GP2-333-502	6TM-S1	Audio Output Plate
C68	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Sync. Coupling
C69	30			SI30		5W5Q3	GP1K-200	1FM-42	Sync. Sep. Plate *
C70	.01	600		P868-01	D6-103	PTE6S1	GP2-333-502	6TM-S1	Sync. Coupling *
C71	2000	500		1467-002	D6-202	1W5D2	GP2-333-202	1FM-22	Integrator Net.
C72	5000	500		1467-005	D6-502	lD5D5	GP2-333-502	1FM-25	Integrator Net.
C73	5000	500		1467-005	D6-502	lD5D5	GP2-333-502	1FM-25	Integrator Net.
C74	5000	500		1467-005	D6-502	lD5D5	GP2-333-502	1FM-25	Vert. Sync. Coupling
C75	.1	600		P868-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C76	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Vert. Feedback
C77	.1	600		P868-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C78	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Horiz. Sync. Coupling
C79	1000			SI1000	D6-102	1W5D1	GP2L-102	5HK-D1	Horiz. Sync. Coupling
C80	.01	600		P868-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	AFC Filter *
C81	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	AFC Filter
C82	.1	600		P868-1	DF-104	PTE6P1		6TM-P1	AFC Filter
C83	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	AFC Filter
C84	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Horiz. MV Grid ¶
C85	4000	500		1464-004		1DR5D4		MS-24	Fixed Trimmer
C86	200	500		1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	Horiz. MV Feedback
C87	350	500		1468-00035			GP2K-361	1FM-335	Horiz. Discharge
C88	200	500		1468-0002	D6-201	5W5T2	GP2K-201	1FM-32	Horiz. Sweep Coupling
C89	.05	600		P868-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C90	.05	400		P488-05	DF-503	PTE4S5		4TM-S5	Damper Filter
C91	.05	600		P868-05	DF-503	PTE6S5		6TM-S5	Damper Filter
C92	.05	600		P868-05	DF-503	PTE6S5		6TM-S5	Accelerating Anode Dec.
C93	500	20000		HV20C	TV3-502				HV Filter
C94	.05	600		P868-05	DF-503	PTE6S5		6TM-S5	Line Filter
C95	.05	600		P868-05	DF-503	PTE6S5		6TM-S5	Line Filter
C96	.002	600		P868-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Fil. Bypass
C97	.002	600		P868-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Damper Fil.
C98	.002	600		P868-002	D6-202	PTE6D2	GP2-333-202	6TM-D2	Damper Fil.
C99	5000			BPD-005	DD-502	lD5D5	811-005	5HK-D5	Switch Strut Isolation
C100	.47	600		684-5		GT6P5		TC-5	Vert. Sweep Coupling *

* Not used in all models.
† Used only in models having Electrical Centering Controls.
‡ Some models use .01MFD in this application.
¶ Some models use .05MFD in this application.
• Some models use 220MMF in this application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	INSTALLATION NOTES
R1A	500KΩ	½	TRV-75	QI3-133	AG-60-Z	B-60-S	Volume Control
B	Shaft		Not req.	Not req.	FS-3	Not req.	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	Not req.	Attach to R1A per instructions
R2A	500KΩ	½	TRV-95	Concentrikit BII-133 ϕ	RTV-57		Vert. Hold Control - Front
B	50KΩ	½		BII-123 ϕ			Horiz. Hold Control - Rear
C	Shaft end			E-202 ϕ			Attach per instructions in Concentrikit
R3A	1000Ω	½	TRV-76	Concentrikit BII-108 ϕ	RTV-134		Contrast Control - Front
B	25KΩ	½		BII-120 ϕ			Brightness Control - Rear
C	Shaft end			E-202 ϕ			Attach per instructions in Concentrikit
R4A	5000Ω	½	TRV-91	QII-144	AM-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R4A per instructions
R5A	2Meg	½	TRV-90	QII-139	AM-83-S	AN-75	Height Control
B	Shaft		Not req.	RQ	FKS-1/4	AK-1	Attach to R5A per instructions
R6	1000Ω	4	TRV-94		#RTV-278	#SVP-993	Focus Control - Wire Wound - See Note 1
R7	25Ω	2	TRV-93	W-25 #	#43-25	VK-111	Horiz. Centering Control - Wire Wound See Note 1
R8	25Ω	2	TRV-93		RTV-15		Vert. Centering Control - Wire Wound - Tapped at 12.5Ω - See Note 1
R9	200KΩ	½					AGC Control - See Note 1

ϕ Additional parts to be used with Concentrikit.
Fashion Shaft to Duplicate Original.
Note 1 Not used in all models.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC Part No.	IRC Part No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED.
R10	1Meg	20%			RF Amp. Grid
R11	100Ω	20%		BTS-100	RF Amp. Cathode
R12	1000Ω	20%		BTS-1000	RF Amp. Decoupling
R13	4700Ω			BTS-4700	RF Coil Shunt
R14	4700Ω			BTS-4700	Mixer Grid Coil Shunt
R15	1Meg	20%		BTS-1Meg	Mixer Grid
R16	1000Ω	20%		BTS-1000	Mixer Decoupling
R17	27KΩ	20%			Osc. Grid
R18	27KΩ	20%			Osc. Grid
R19	47 Ω	20%			Osc. Cathode
R20	1000Ω	20%		BTS-1000	Decoupling
R21	330Ω			BW-½-330	AGC Network - Wire Wound
R22	330Ω			BW-½-330	AGC Network - Wire Wound
R23	330Ω			BW-½-330	AGC Network - Wire Wound
R24	6800Ω	20%			1st. Video IF Amp. Grid
R25	47Ω	20%			1st. Video IF Amp. Cathode - See Note 3
R26	150Ω	20%		BTS-150	1st. Video IF Amp. Decoupling
R27	15KΩ	20%		BTS-15K	2nd. Video IF Amp. Grid
R28	47Ω	20%			2nd. Video IF Amp. Cathode - See Note 3
R29	150Ω	20%		BTS-150	Decoupling
R30	22KΩ				3rd. Video IF Amp. Grid
R31	47Ω	20%			3rd. Video IF Amp. Cathode - See Note 3

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC Part No.	IRC Part No.	IDENTIFICATION CODES
R32	150Ω	20%		BTS-150	Decoupling
R33	8200Ω			BTS-8200	4th. Video IF Transformer Shunt
R34	82Ω			BTS-82	4th. Video IF Amp. Cathode - See Note 4
R35	8200Ω			BTS-8200	Video Det. Diode Load
R36	100KΩ	20%		BTS-100K	Voltage Divider
R37	470KΩ	20%		BTS-470K	AGC Network
R38	2.2Meg	5%		BTS-2.2Meg-5%	AGC Network
R39	47KΩ			BTS-47K	AGC Network - See Note 2
R40	150KΩ			BTS-150K	AGC Network - See Note 2
R41	1Meg	20%		BTS-1Meg	Video Amp. Grid
R42	5600Ω			BTS-5600	Video Amp. Plate
R43	470KΩ	20%		BTS-470K	Video Output Grid
R44	450Ω	20%			Video Output Cathode
R45	3300Ω			BTA-3300	Video Output Plate
R46	2200Ω	20%		BTS-2200	Isolation
R47	270KΩ	20%		BTS-270K	DC Restorer Diode Load
R48	680KΩ			BTS-680K	Picture Tube Grid
R49	10KΩ			BTS-10K	Picture Tube Cathode - See Notes 5 and 6
R50	47KΩ	20%			Sound IF Amp. Grid - See Note 7
R51	47KΩ	20%		BTS-47K	Sound IF Amp. Screen
R52	1000Ω	20%		BTS-1000	Sound IF Amp. Plate Decoupling
R53	27KΩ	20%		BTS-27K	Voltage Divider
R54	15KΩ			BTS-15K	Ratio Det. Diode Load
R55	15KΩ			BTS-15K	Ratio Det. Diode Load
R56	47KΩ	20%		BTS-47K	De-emphasis
R57	10Meg	20%		BTS-10Meg	AF Amp. Grid
R58	390KΩ	20%		BTS-390K	AFC Amp. Plate
R59	470KΩ	20%		BTS-470K	Output Grid
R60	400Ω	5%			Output Cathode
R61	1500Ω			1 5/4A-1500	Output Decoupling - Wire Wound
R62	37500Ω			2D-2750	Voltage Divider - Wire Wound
R63	3.3Meg	20%		BTS-3.3Meg	Sync. Sep. Plate - See Note 8
R64	56KΩ			BTS-56K	Voltage Divider - See Note 2
R65	1Meg			BTS-1Meg	Sync. Amp. Grid - See Note 2
R66	3900Ω	20%		BTS-3900	Sync. Amp. Cathode
R67	5600Ω			BTB-5600	Sync. Amp. Plate - See Note 9
R68	6800Ω			BTS-6800	Sync. Amp. Plate - See Note 2
R69	22KΩ	5%		BTB-22K-5%	Voltage Divider - See Note 2
R70	27KΩ	20%		BTS-27K	Integrator
R71	8200Ω	5%		BTS-8200	Integrator
R72	8200Ω	5%		BTS-8200	Integrator
R73	820KΩ			BTA-820K	Vert. Osc. Grid - See Note 10
R74	1Meg	20%		BTS-1Meg	Vert. Osc. Plate
R75	6.8Meg	20%		BTS-6.8Meg	Voltage Divider
R76	100KΩ	20%		BTS-100K	Voltage Divider
R77	3300Ω	20%		BTS-3300	Vert. Peaking
R78	5600Ω			BTS-5600	Vert. Peaking
R79	330Ω				Parasitic Suppressor
R80	330Ω				Parasitic Suppressor
R81	3.3Meg			BTS-3.3Meg	Vert. Amp. Grid
R82	470Ω	20%		BTS-470	Vert. Amp. Cathode
R83	1000Ω	20%		BTA-1000	Vert. Amp. Decoupling
R84	100KΩ	20%		BTS-100K	Horiz. Phase Det. Diode Load
R85	100KΩ	20%		BTS-100K	Horiz. Phase Det. Diode Load
R86	4.7Meg			BTS-4.7Meg	Horiz. Phase Det. Diode Load
R87	27KΩ			BTS-27K	Horiz. Phase Det. Diode Load - See Note 11
R88	4700Ω	20%		BTS-4700	Horiz. Feedback Network
R89	2200Ω	20%		BTS-2200	Horiz. Feedback Network
R90	470KΩ	20%		BTS-470K	Horiz. AFC Filter
R91	36KΩ	5%			Decoupling
R92	1500Ω			BTS-1500	Horiz. MV Cathode
R93	5600Ω			BTS-5600	Horiz. MV Plate
R94	100KΩ	20%		BTS-100K	Horiz. MV Grip
R95	220KΩ	20%		BTS-220K	Horiz. MV Plate
R96	39KΩ	5%		BTB-39K-5%	Decoupling
R97	330Ω			BW-½-330	Parasitic Suppressor - Wire Wound
R98	1Meg	20%		BTS-1Meg	Horiz. Output Grid
R99	1Meg	20%		BTS-1Meg	Horiz. Output Grid - See Note 2
R100	68KΩ			BTS-68K	Horiz. Output Screen
R101	68KΩ			BTB-68K	Horiz. Output Screen
R102	180KΩ			BTS-180K	Horiz. Output Screen - See Note 2
R103	470KΩ	20%			HV Filter
R104	470KΩ	20%		BTS-470K	Acc. Anode Load
R105	1.2Meg	20%		BTS-1.2Meg	Voltage Divider
R106	350Ω	20%			Focus Coil Shunt
R107	350Ω	20%			Focus Coil Shunt
R108	580Ω			BW-2-580	Focus Control Shunt - Wire Wound - See Note 12
R109	8Ω				Bias Network - Wire Wound

Note 2 Not used in all models.
Note 3 Some models use 82Ω resistor in this application.
Note 4 Some models use 47Ω resistor in this application.
Note 5 Some models use 8200Ω resistor in this application.
Note 6 Some models use 15KΩ resistor in this application.
Note 7 Some models use 470KΩ resistor in this application.
Note 8 Some models use 1Meg resistor in this application.
Note 9 Some models use 3900Ω resistor in this application.
Note 10 Some models use 680KΩ resistor in this application.
Note 11 Some models use 270Ω resistor in this application.
Note 12 Some models use 350Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS: FIELD RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: AUTOMATIC Part No.	JENSEN Part No.	QUAM Part No.	NOTES
SP1	P M	3.4Ω		ST803 Mod. P525-V	52A1	
	CONE DIA.	V. C. DIA.				
SP2	5"	9/16				

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AUTOMATIC Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.
T1	117VAC ② 2.1A	780VCT .250ADC	5VAC ③ 3A	6.3VAC ④ 7.2A	NE-708P			

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA AUTOMATIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	NOTES
T2	170Ω	920Ω		A-8121	A-4000	TBO-3	Vert. Block Osc. Trans.
T3	420Ω	23Ω	GE-77J1	A-8130	HV0-7 and MWC-1		Horiz. Output Trans.
	Tap 41Ω	Taps 12Ω and 18Ω					
		SEC. 2					
		0Ω					
		SEC. 3					
		0Ω					
T4	555Ω	6.7Ω	NE-647P	A-8112 ①	A-3035 ①	TSO-1 ①	Vert. Output Trans.
T5A	17.5Ω		GE-77J2				Horiz. Deflection Coils
B	65Ω						Vert. Deflection Coils
T6	1.3KΩ						Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA AUTOMATIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
T7	4.6KΩ	3.4Ω	320Ω	.6Ω		A-3877	A-2930	RO-9 ①	① Drill one new mounting hole.

FILTER CHOKE

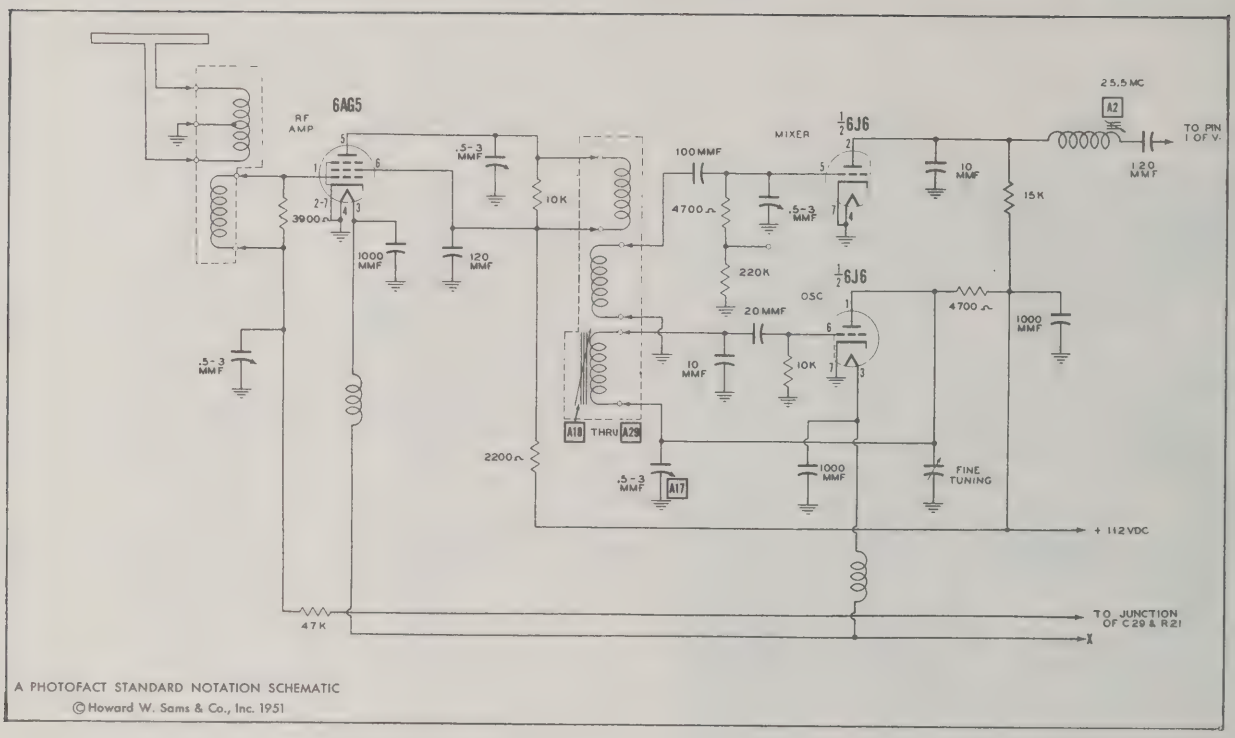
ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∽)	REPLACEMENT DATA AUTOMATIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.250A	26.5Ω	1 Henry	NE-685	C-2326 ①	C-2996 ①	TR-3300①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AUTOMATIC PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Trans.	.1ΩCT				
L3	Ant. Coil	0Ω				Channel #2
L4	Ant. Coil	0Ω				Channel #3
L5	Ant. Coil	0Ω				Channel #4
L6	Ant. Coil	0Ω				Channel #5
L7	Ant. Coil	0Ω				Channel #6
L8	Mixer Grid Coil	0Ω				Channel #2
L9	Mixer Grid Coil	0Ω				Channel #3
L10	Mixer Grid Coil	0Ω				Channel #4
L11	Mixer Grid Coil	0Ω				Channel #5
L12	Mixer Grid Coil	0Ω				Channel #6
L13	Osc. Coil	0Ω				Channel #2
L14	Osc. Coil	0Ω				Channel #3
L15	Osc. Coil	0Ω				Channel #4
L16	Osc. Coil	0Ω				Channel #5
L17	Osc. Coil	0Ω				Channel #6
L18	Osc. Coil	0Ω				Channel #7
L19	Osc. Coil	0Ω				Channel #8
L20	Osc. Coil	0Ω				Channel #9
L21	Osc. Coil	0Ω				Channel #10
L22	Osc. Coil	0Ω				Channel #11
L23	Osc. Coil	0Ω				Channel #12
L24	Osc. Coil	0Ω				Channel #13
L25	RF Choke	2.2Ω				
L26	1st Video IF	.1Ω				
L27	Fil. Choke	0Ω				
L28	Fil. Choke	0Ω				
L29	2nd Video IF	.1Ω				
L30	Fil. Choke	0Ω				
L31	3rd Video IF	.1Ω				
L32	Fil. Choke	0Ω				
L33	4th Video IF	.1Ω	.1Ω			
L34	Sound Trap	0Ω				
L35	Fil. Choke	0Ω				
L36	5th Video IF	.1Ω	.1Ω			
L37	Fil. Choke	0Ω				
L38	Peaking	7.2Ω			19-1921 †	160 Microhenries wound on 33KΩ resistor.
L39	Peaking	18Ω				700 Microhenries
L40	Fil. Choke	0Ω				
L41	Peaking	9Ω			19-1922 †	205 Microhenries wound on 33KΩ resistor.
L42	Peaking	14Ω			19-1923	480 Microhenries
L43	Fil. Choke	0Ω				
L44	Peaking	6.2Ω			19-1921 §	118 Microhenries wound on 15KΩ resistor.
L45	Peaking	12Ω			19-1922	290 Microhenries
L46	Fil. Choke	0Ω				
L47	Sound IF	1.7Ω	1.7Ω			
L48	Ratio Det. Trans.	4Ω	.7Ω			Tap .5Ω
L49	Fil. Choke	0Ω				
L50	Horiz. Osc.	105Ω				
L51	Fil. Choke	0Ω				
L52	Fil. Choke	0Ω				
L53	Horiz. Width					Not used in all models.
L54	Horiz. Lin.	30Ω				

MISCELLANEOUS

ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M1	RF Tuner		
M2	Ion Trap		
M3	Focus Magnet		
B2	Trimmer	T52410-3	Horiz. Drive 25-250MMF



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE TUNER SCHEMATIC
DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove five wood screws from rear cover. Remove rear cover.
3. Disconnect speaker.
4. Remove antenna terminal strip.
5. Disconnect yoke socket.
6. Disconnect picture tube socket.
7. Remove high voltage lead.
8. Remove two metal bolts from rectifier chassis. Remove chassis.
9. Remove four metal bolts from receiver chassis. Remove chassis.
10. Remove four wing nuts from speaker. Remove speaker.

NOTE:-FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

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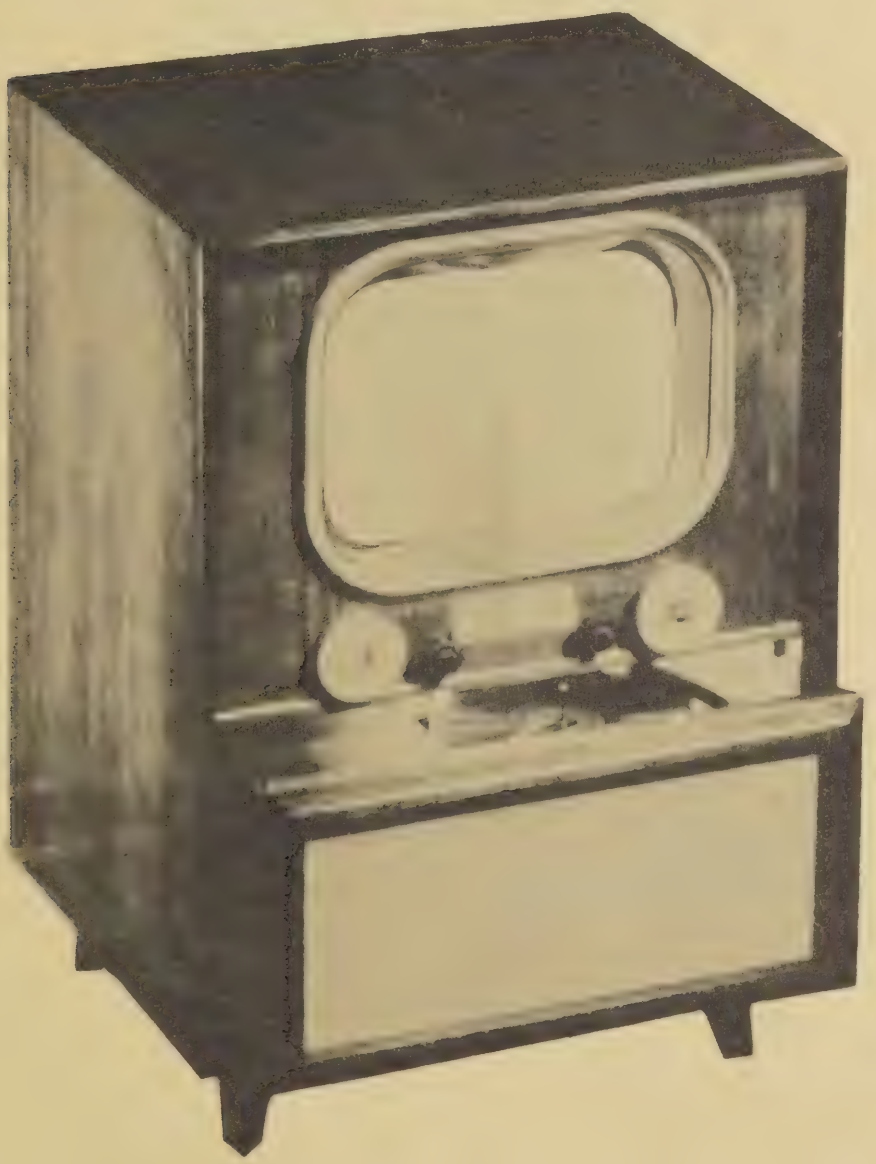
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



FIRESTONE
MODEL 13-G-48

HOWARD W. SAMS & CO., INC. • Indianapolis, Indiana

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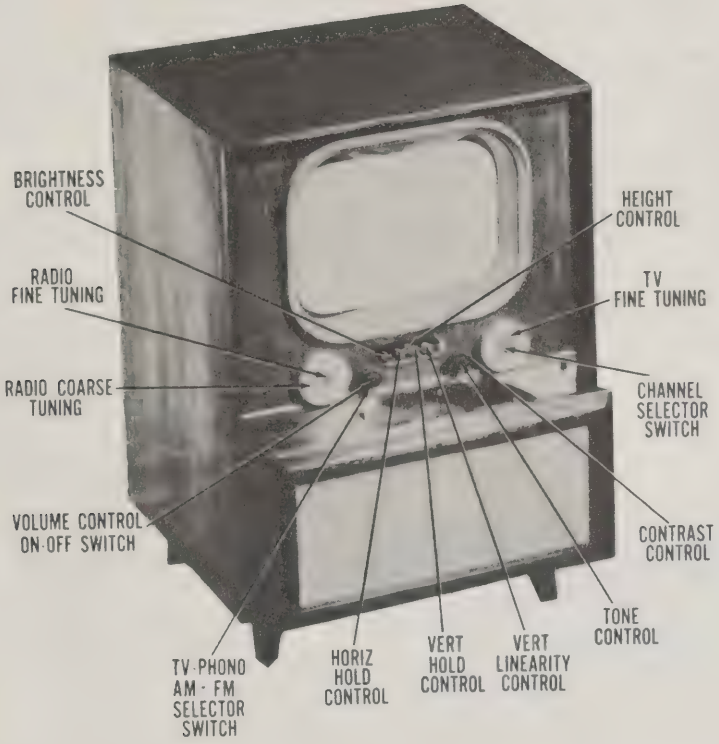
FIRESTONE
MODEL 13-G-48



TRADE NAME	Firestone, Model 13-G-48		
SUPPLIER	Firestone Tire & Rubber Co., Akron, Ohio		
TYPE SET	TV-AM-FM-Phono Combination Receiver		
TUBES	Thirty One		
POWER SUPPLY	110-120 Volts AC - 60 Cycle	RATING	(TV) 2.1 Amp. @ 117 Volts AC (Radio) 1.0 Amp. @ 117 Volts AC
TUNING RANGE	(TV) Channels 2 thru 13 (FM) 88-108MC (AM) 540-1600KC		

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FOR SERVICE INFORMATION ON RECORD CHANGER UNIT - SEE V-M MODEL 950 PHOTOFACT FOLDER # 13 SET #107 OR RECORD CHANGER MANUAL CM-3.

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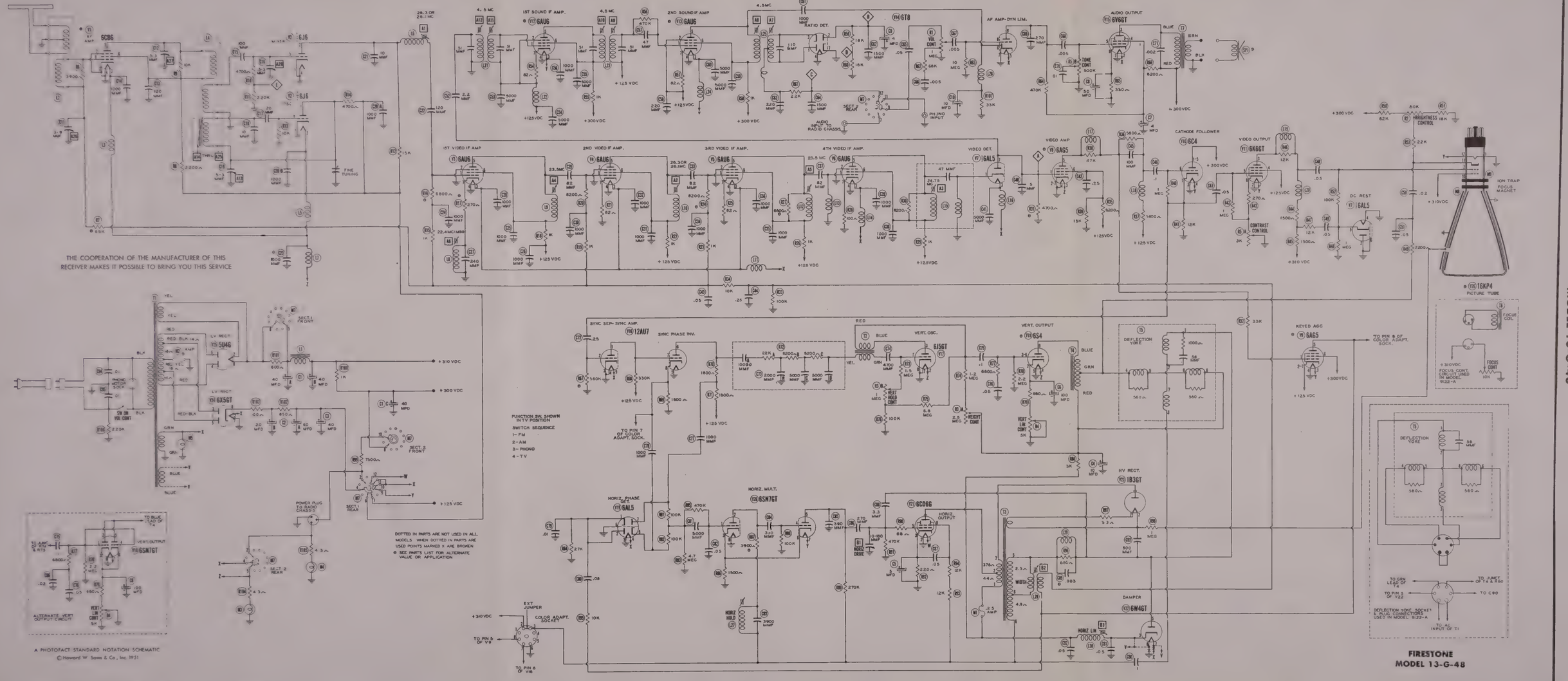
FIRESTONE
MODEL 13-G-48


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
FUNCTION SW. SHOWN IN TV POSITION
SWITCH SEQUENCE
1- FM
2- AM
3- PHONO
4 - TV
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
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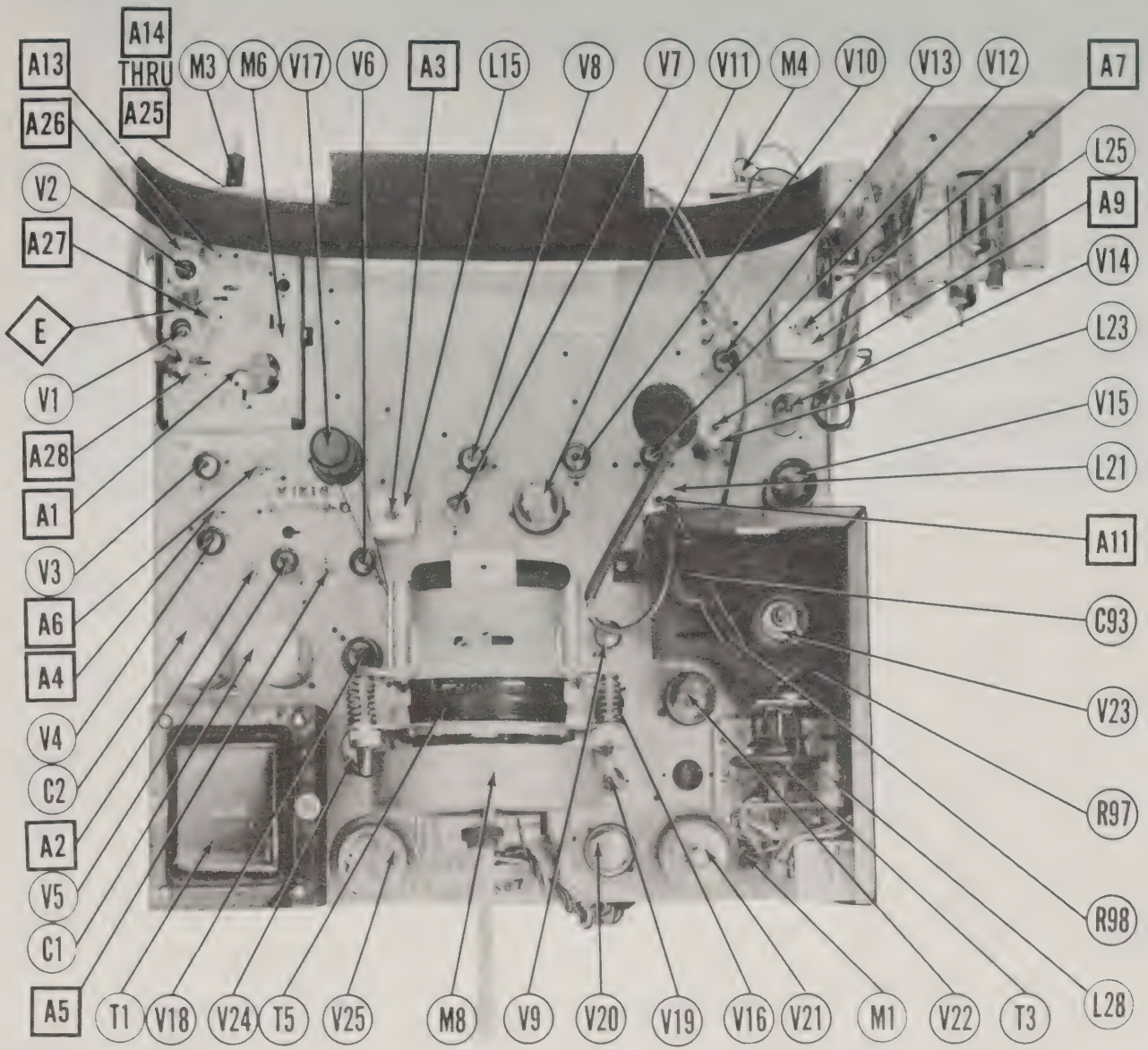
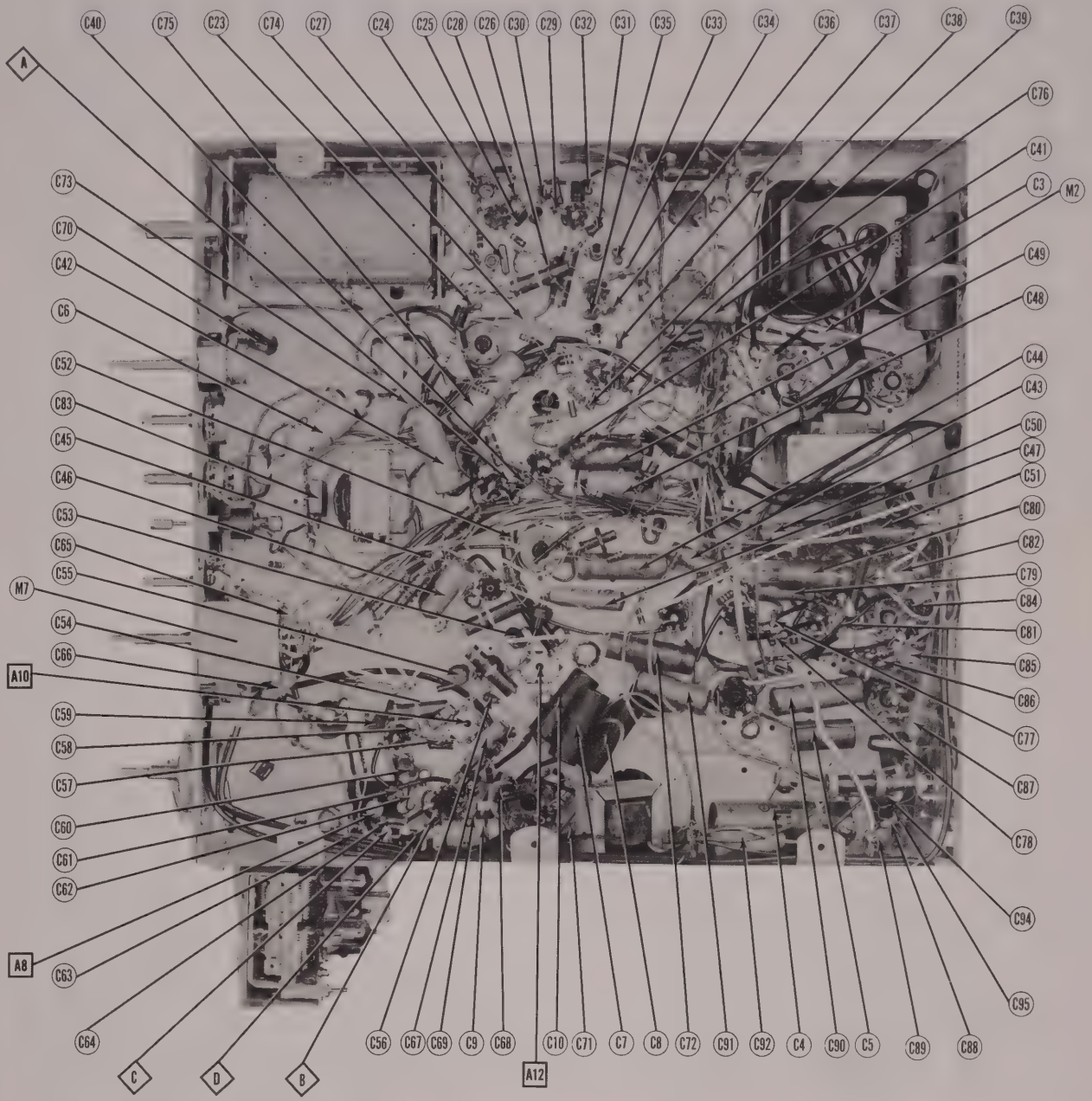
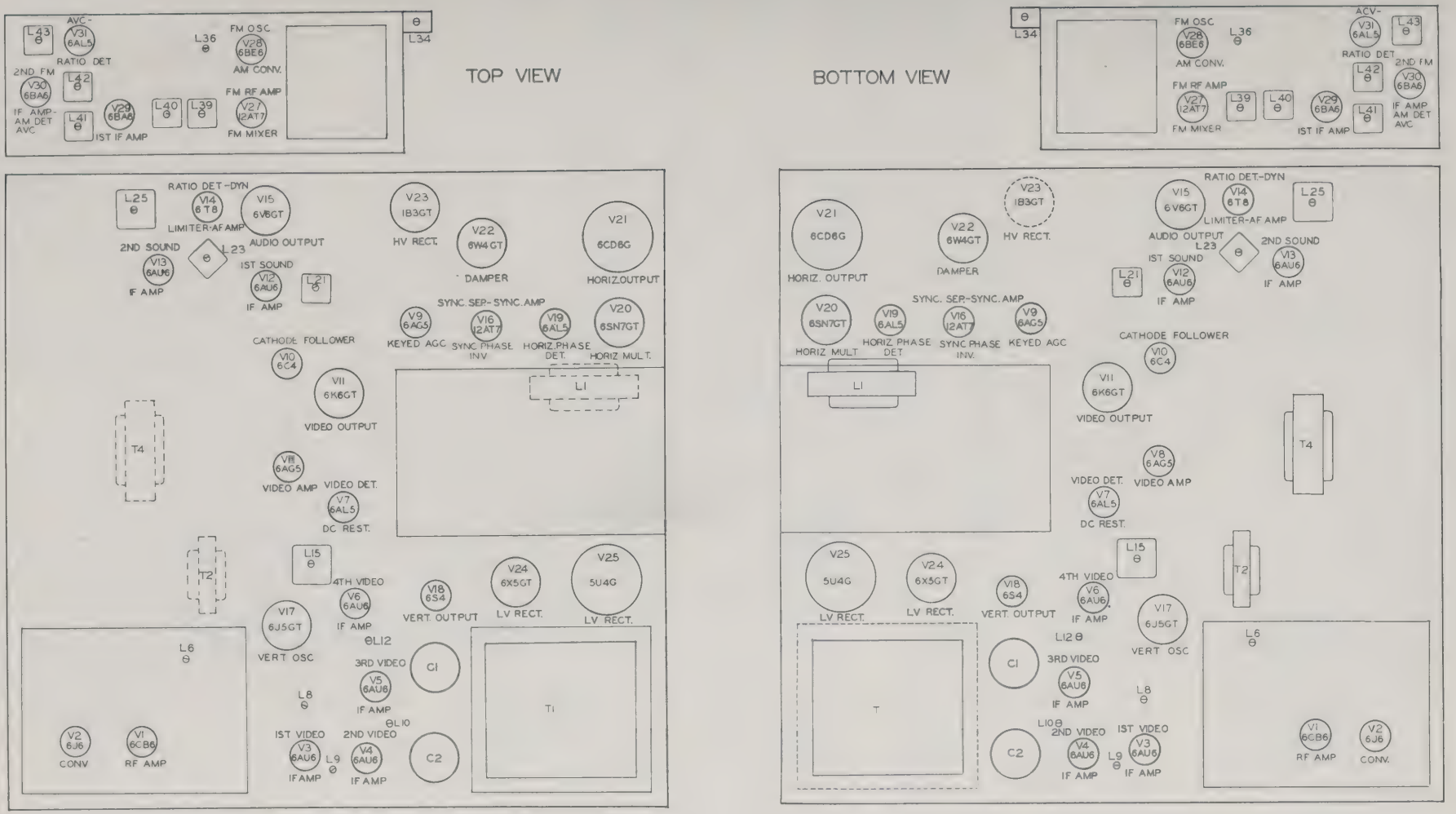


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube, (V20), from its socket.
Turn the function selector switch to "TV", (maximum clockwise).

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the junction of R34 and C43. Connect the positive lead to chassis.
* On chassis which have an "E" in the series designation stamped on the rear chassis, A1 and A3, are tuned to 26.1MC instead of 26.3MC.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1	Direct	High side to an unground-ed tube shield floating over dummy converter tube, (V2). Low side to chassis.	26.3MC or 26.1MC * (See note above)	Any	DC probe thru 10KΩ to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2	"	"	24.75MC	"	"	A3	"
3	"	"	23.5MC	"	"	A4, A5	"
4	"	"	22.4MC	"	"	A6	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect a 10KΩ isolation resistor in series with the vertical input lead of the oscilloscope, and a 1000MMF capacitor across the vertical input terminals.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5	Direct	High side to an unground-ed tube shield floating over dummy converter tube, (V2). Low side to chassis.	25MC (10MC SWP)	22.25MC 26.75MC	Any	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1 thru A5 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6	.01MFD	High side to pin 1 (Grid) of 6AL5, (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru 10KΩ to Point (B). Common to chassis.	A7, A8, A9, A10, A11, A12	Adjust for maximum deflection. Note that A7 has a very broad peak.
7	"	"	"	"	DC probe to Point (C). Common to Point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8	.01MFD	High side to pin 1 (cathode of 6AL5, (V7). Low side to chassis	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A8, A9, A10, A11, A12	Disconnect stabilizer capacitor C9. Adjust for maximum amplitude and symmetry as per fig. 2.
9	"	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A7	Reconnect capacitor C9. Adjust A7 so 4.5MC occurs at center of crossover lines as per figure 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be required. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A13. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A13 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Mid-position on the fine tuning control is the position where the "tooth" on the tuning cam points straight down.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A14	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A15	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A16	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A17	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A18	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A19	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A20	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A21	
			79 MC (10MC SWP)	77.25MC 81.75MC	5		A22	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A23	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A24	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A25	

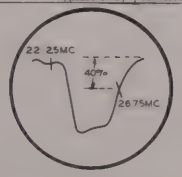


FIG. 1

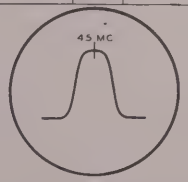


FIG. 2

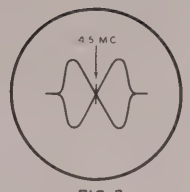


FIG. 3

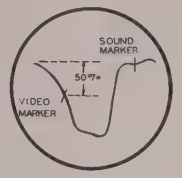


FIG. 4

FIG. 5

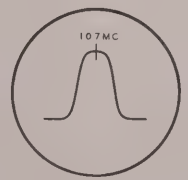


FIG. 6

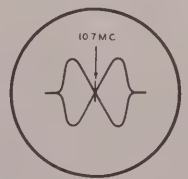


FIG. 7

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (E). Low side to chassis.	A26, A27 A28	Adjust for response curve similar to fig. 5 with markers above 90%.
10	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to fig. 5. If markers fall below 70% on any channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

A temporary pointer must be installed during alignment. Bend a piece of heavy wire around the planitary drive support bracket and shape the end so it points upward between the dial knob and the pilot lamp. The wire will cast a shadow on the dial knob.
Replace the coarse and fine tuning knobs.
Turn the fine tuning knob to maximum counter-clockwise. At this position the tuning gang should be fully closed and the temporary pointer should cast a shadow just to the left of the letters "AM" on the dial scale. If the shadow does not fall at the proper place, loosen the set screws in the hub of the dial drum on the tuning gang and close the gang manually, also position the dial properly, and then tighten the drive drum set screws.

AM ALIGNMENT

Turn the function selector switch to "AM", (second pos. clockwise).
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
11	.1MFD	High side to stator on AM ant. section of tuning gang.	455KC (400% Mod.)	AM	Tuning gang fully open.	Across voice coil.	A29, A30 A31, A32	Adjust for maximum output.
12		Loop	1500KC	"	1500KC	"	A33, A34	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
13		Loop	600KC	"	600KC	"	A35	Adjust for maximum output. Repeat steps 12 and 13 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Turn the function selector switch to "FM", (fully counter-clockwise).

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
14	.01MFD.	High side to stator on "FM" RF Section of tuning gang. Low side to chassis.	10.7MC (unmod.)	FM	Tuning gang fully open.	DC probe to Point (F). Common to chassis.	A36, A37 A38, A39, A40, A41	Adjust for maximum deflection. Notice that A36 has a very broad peak.
15	"	"	"	"	"	DC probe to Point (G). Common to Point (D).	A36	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
14	.01MFD	High side to stator on "FM" RF section of tuning gang. Low side to chassis.	10.7MC (450KC SWP)	FM	Point of non-interference.	Vert. Amp. to Point (G). Low side to chassis.	A37, A38 A39, A40 A41	Disconnect stabilizer capacitor C97. Adjust for maximum amplitude and symmetry as per fig. 6.
15	"	"	"	"	"	Vert. Amp. to Point (G). Low side to chassis.	A36	Reconnect capacitor C97. Adjust A36 so 10.7MC occurs at center of corssover lines as per fig. 7. SLIGHTLY retouch A37 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
16	270Ω carbon resistor	High side thru 270Ω to "FM" ant. terminal on terminals strip near tuning gang. Low side to chassis.	108MC (unmod.)	FM	108MC	DC probe to Point (F). Common to chassis.	A42	Adjust for amaximum deflection.
17	"	"	106MC	"	Tune for max. deflection.	"	A43	"
18	"	"	88MC	"	"	"		Check dial calibration. If dial is off more than .3MC, remove bottom cover and adjust L33 and L34 turn spacing for maximum deflection. (Remember that replacing bottom cover will alter calibration.) Repeat steps 16, 17, and 18 until calibration is correct and sensitivity is maximum with bottom cover in place.

FIRESTONE
MODEL 13-G-48

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-.2VDC	0V	6.2VDC	0V	95VDC	95VDC	0V		
V 2	6J6	105VDC	90VDC	6.2VDC	0V	-2.2VDC	§-4.8VDC	0V		
V 3	6AU6	0V	0V	6.3VAC	0V	120VDC	120VDC	1VDC		
V 4	6AU6	0V	0V	6.3VAC	0V	120VDC	120VDC	.7VDC		
V 5	6AU6	0V	0V	6.3VAC	0V	120VDC	120VDC	.7VDC		
V 6	6AU6	0V	0V	6.3VAC	0V	120VDC	120VDC	.8VDC		
V 7	6AL5	0V	0V	6.2VAC	0V	13VDC	0V	-.6VDC		
V 8	6AG5	-.6VDC	0V	6.3VAC	0V	80VDC	75VDC	0V		
V 9	6AG5	75VDC	125VDC	6.3VAC	0V	-.1VDC	255VDC	125VDC		
V 10	6C4	255VDC	0V	0V	6.3VAC	255VDC	17VDC	110VDC		
V 11	6K6GT	0V	0V	290VDC	130VDC	1.3VDC	0V	6.3VAC	12VDC	
V 12	6AU6	125VDC	125VDC	6.3VAC	0V	240VDC	240VDC	125VDC		
V 13	6AU6	110VDC	125VDC	6.2VAC	0V	240VDC	240VDC	125VDC		
V 14	6T8	-.2VDC	-1VDC	-.2VDC	0V	6.3VAC	-2VDC	0V	-.6VDC	65VDC
V 15	6V6GT	0V	6.3VAC	230VDC	215VDC	0V	255VDC	0V	12VDC	
V 16	12AU7	20VDC	-.4VDC	0V	0V	0V	90VDC	20VDC	19VDC	6.3VAC
V 17	6J5GT	0V	6.3VAC	65VDC	0V	-4.3VDC -3.8VDC	0V	0V	0V	
V 18	6S4	0V	29VDC 16VDC	0V	6.3VAC	0V	0V	0V	0V	440VDC
V 19	6AL5	0V	0V	0V	6.3VAC	7.5VDC	0V	-4.1VDC		
V 20	6SN7GT	.8VDC	310VDC	14VDC	-2.4VDC	125VDC	14VDC	6.3VAC	0V	TOP CAP *
V 21	6CD6G	0V	0V	24VDC	0V	0V	0V	6.3VAC	150VDC	
V 22	6W4GT	0V	0V	480VDC	0V	320VDC	325VDC	6.3VAC	0V	
V 23	1B3GT	* DO NOT MEASURE								
V 24	6X5GT	.1VAC	6.3VAC	190VAC	340VDC	190VAC	0V	0V	185VDC	
V 25	5U4G	130VDC	340VDC	0V	340VAC	0V	340VAC	0V	340VDC	
V 26	16KP4	0V	1.6VDC	PIN 10 325VDC	PIN 11 90VDC	PIN 12 6.3VAC				

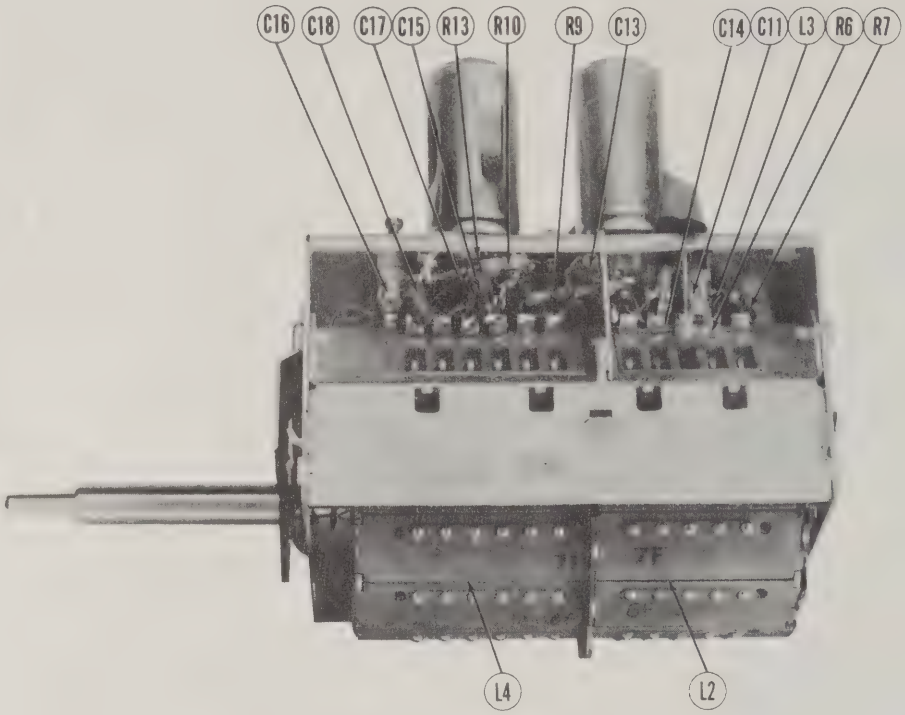
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

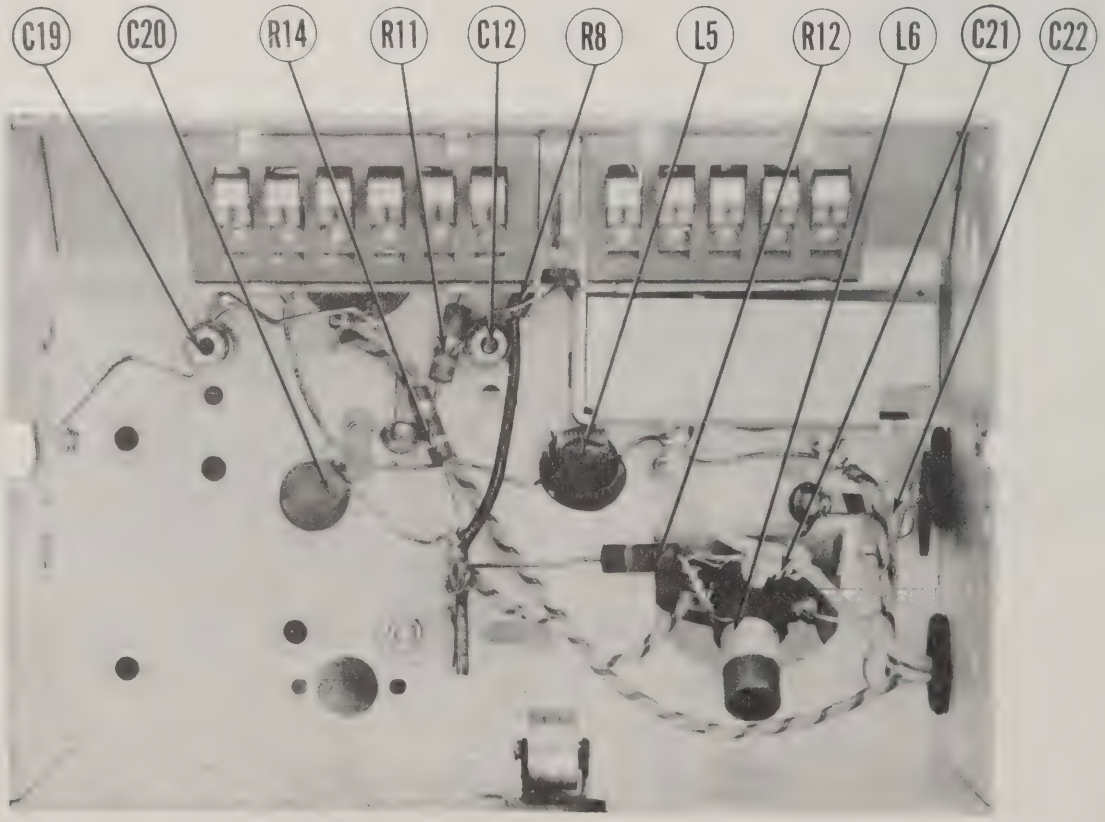
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	182KΩ	0Ω	.1Ω	0Ω	▲3.1KΩ	▲3.1KΩ	0Ω		
V 2	6J6	▲5.6KΩ	▲16KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	118KΩ	0Ω	.1Ω	0Ω	▲2KΩ	▲2KΩ	270Ω		
V 4	6AU6	119KΩ	0Ω	.1Ω	0Ω	▲2KΩ	▲2KΩ	82Ω		
V 5	6AU6	119KΩ	0Ω	.1Ω	0Ω	▲2KΩ	▲2KΩ	82Ω		
V 6	6AU6	2.2Ω	0Ω	.3Ω	0Ω	▲2KΩ	▲2KΩ	100Ω		
V 7	6AL5	2.2Ω	0Ω	.7Ω	0Ω	1Meg	0Ω	4.7KΩ		
V 8	6AG5	4.7KΩ	0Ω	.1Ω	0Ω	▲12KΩ	▲9KΩ	0Ω		
V 9	6AG5	▲45KΩ	▲950Ω	.1Ω	0Ω	100KΩ	†1KΩ	▲950Ω		
V 10	6C4	†1KΩ	Inf.	0Ω	.1Ω	†1KΩ	1Meg	12KΩ		
V 11	6K6GT	Inf.	0Ω	†3KΩ	▲950Ω	1Meg	270Ω 3.2KΩ	.1Ω		
V 12	6AU6	▲950Ω	▲950Ω	.3Ω	0Ω	†2KΩ	†2KΩ	▲1KΩ		
V 13	6AU6	▲470KΩ	▲950Ω	1Ω	0Ω	†2KΩ	†2KΩ	▲1KΩ		
V 14	6T8	Inf.	36KΩ	Inf.	0Ω	.1Ω	33KΩ	0Ω	10Meg	†480KΩ
V 15	6V6GT	Inf.	.1Ω	†1.6KΩ	†9.2KΩ	500KΩ	†1KΩ	0Ω	330Ω	
V 16	12AU7	▲330KΩ	560KΩ	0Ω	0Ω	0Ω	▲4.5KΩ	▲330KΩ	1.8KΩ	.1Ω
V 17	6J5GT	0Ω	.1Ω	#1.2Meg #2.7Meg.	Inf.	1.6Meg 2.6Meg	Inf.	0Ω	0Ω	
V 18	6S4	Inf.	680Ω 5.6KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	Inf.	Inf.	#4.3KΩ
V 19	6AL5	27KΩ	27KΩ	0Ω	.1Ω	4.8Meg	0Ω	4.8Meg		
V 20	6SN7GT	5.1Meg	†3.9KΩ	1.5KΩ	100KΩ	†270KΩ	1.5KΩ	.1Ω	0Ω	TOP CAP #44Ω
V 21	6CD6G	Inf.	0Ω	220Ω	Inf.	470KΩ	470KΩ	.1Ω	†24KΩ	
V 22	6W4GT	Inf.	Inf.	450KΩ	Inf.	†90Ω	5KΩ	.1Ω	0Ω	
V 23	1B3GT	PINS 1 - 8 HAVE INFINITE RESISTANCE								TOP CAP # 465Ω
V 24	6X5GT	.2Ω	.1Ω	16Ω	†0Ω	16Ω	Inf.	0Ω	25KΩ	
V 25	5U4G	25KΩ	80KΩ	Inf.	30Ω	Inf.	30Ω	Inf.	80KΩ	
V 26	16KP4	0Ω	1.1Meg	PIN 10 †90Ω	PIN 11 38KΩ	70KΩ	PIN 12 .1Ω			

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED
▲ MEASURED FROM PIN 8 OF V24
MEASURED FROM PIN 3 OF V22
† MEASURED FROM PIN 8 OF V25

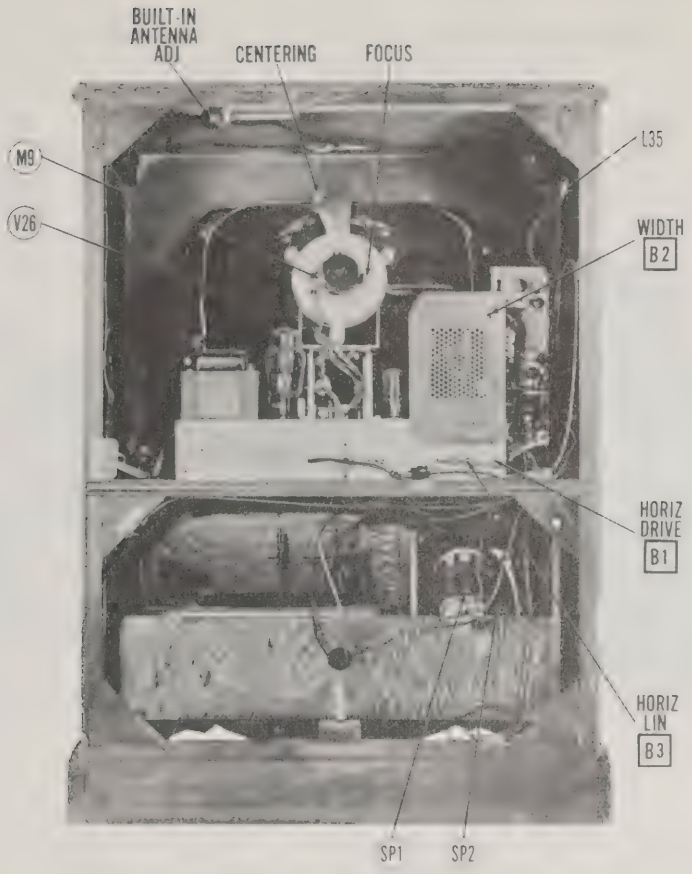
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control to synchronize the picture horizontally.

Adjust the horizontal drive trimmer, (B1), counter-clockwise as far as possible without crowding or vertical lines appearing in the picture.

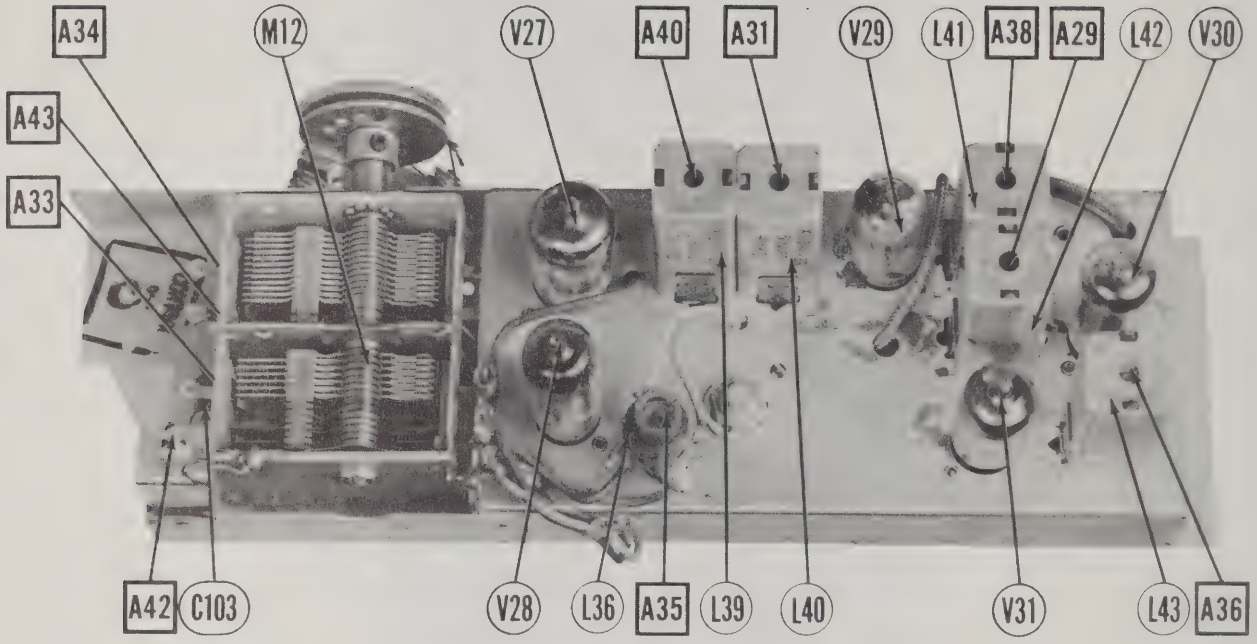
Adjust the width slug, (B2), until the picture fills the mask horizontally.

Adjust the horizontal linearity slug, (B3), until the picture is symmetrical from left to right. Slight readjustment of B1 may be required for optimum results.

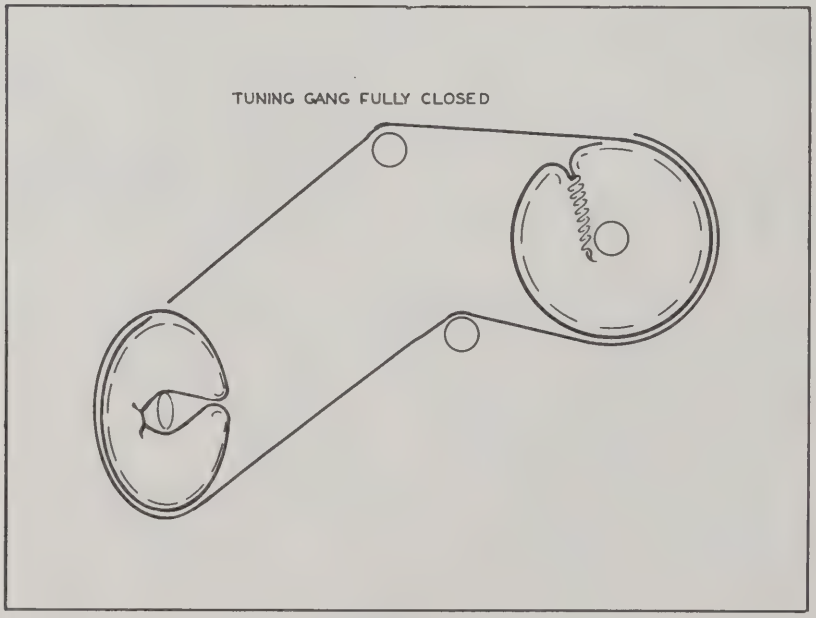
DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove seven wood screws securing rear cover to chassis. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker.
6. Disconnect phono input plug.
7. Disconnect AM loop antenna.
8. Disconnect FM external antenna lead.
9. Remove jewel pilot lamp.
10. Remove six hex head bolts from chassis. Remove chassis.
11. Remove four hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.



RADIO CHASSIS-TOP VIEW



DIAL CORD STRINGING

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1A	RF Amplifier	6CB6	6CB6	6CK	
B	RF Amplifier	6BC5	6BC5	7BD	
C	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd Video IF Amp.	6AU6	6AU6	7BK	
V6	4th Video IF Amp.	6AU6	6AU6	7BK	
V7	Video Detector - DC Restorer	6AL5	6AL5	6BT	
V8A	Video Amplifier	6AG5	6AG5	7BD	
B	Video Amplifier	6AU6	6AU6	7BK	
V9A	Keyed AGC	6AG5	6AG5	7BD	
B	Keyed AGC	6AU6	6AU6	7BK	
V10	Cathode Follower	6C4	6C4	6BG	
V11	Video Output	6K6GT	6K6GT	7S	
V12A	1st Sound IF Amp.	6AU6	6AU6	7BK	
B	1st Sound IF Amp.	6BH6	6BH6	7CM	
V13A	2nd Sound IF Amp.	6AU6	6AU6	7BK	
B	2nd Sound IF Amp.	6BH6	6BH6	7CM	
V14	Ratio Detector - Dynamic Limiter - AF Amplifier	6T8	6T8	9E	
V15	Audio Output	6V6GT	6V6GT	7AC	
V16	Sync. Separator - Sync. Amplifier - Sync. Phase Inv.	12AU7	12AU7	9A	
V17	Vertical Osc.	6J5GT	6J5GT	6Q	
V18A	Vertical Output	6S4	6S4	9AC	
B	Vertical Output	6SN7GT	6SN7GT	8BD	
V19	Horiz. Phase Det.	6AL5	6AL5	6BT	
V20	Horizontal Mult.	6SN7GT	6SN7GT	8BD	
V21	Horizontal Output	6CD6G	6CD6G	5BT	
V22	Damper	6W4GT	6W4GT	4CG	
V23	H.V. Rectifier	1B3GT	1B3GT	3C	
V24	LV Rectifier	6X5GT	6X5GT	6S	
V25	LV Rectifier	5U4G	5U4G	5T	
V26A	Picture Tube	16KP4	16KP4	12D	
B	Picture Tube	16RP4	16RP4	12D	
C	Picture Tube	16TP4	16TP4	12D	
D	Picture Tube	19AP4	19AP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	508072	AFH888J		UPT44445		TVL-3787	▬ Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C2A	60	300	508073	AFH1242J		UPT6245		TVL-2579	▬ Filter
B	20	300							■ Filter
C3	40	300	160095	PRS450/40		BR4035		TVA-1611	Filter
C4	10	600	508680	PRS600/10		BRHV610		TVA-1902	Decoupling
C5	5	50	508684	PRS150/4		BR550		TVA-1303	Horiz. ¶Output Cathode
C6	100	50	508682	PRS50/100		BRH50I		TVA-1310	Vert. Output Cathode
C7	4	50	504719	PRS150/4		BR550		TVA-1303	Decoupling
C8	50	25	502527	PRS25/50		BR502A		TVA-1206	Audio Output Cathode
C9	4	150	502547	PRS150/4		BR415		TVA-1402	Stabilizing Cap
C10	10	150	505174	PRS150/12		BR1015		TVA-1406	Dyn. Limiter Cap
C11	3-9		509064						Variable Trimmer
C12	.5-3		507968		829-3				Variable Trimmer
C13	120		513439	SI120	D6-121		GP2K-121	19C29	RF Amp. Decoupling
C14	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	RF Amp. Fil.
C15	100		513440	SI100N750	TCN-100		N750L-101	19C11	RF Coupling
C16	.5-3		509063		829-3				Variable Trimmer
C17	20		513441	SI20NPO	TCZ-20		NPOK-200		Osc. Grid Cap
C18	10		513442	SI10N750	TCN-10		N750K-100	19C4	Fixed Trimmer
C19	.5-3		507968		829-3				Variable Trimmer
C20A	1000		508576	BPD-001	DD-2-102		812-.001	29C7	RF Bypass
B	1000								Conv. Fil.
C21	10		513444	SI10NPO	TCZ-10		NPOK-100	19C3	Fixed Trimmer
C22	120		512542	SI120	D6-121		GP2K-121	19C29	IF Coupling
C23	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	Fil. Bypass †
C24	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	AGC Filter
C25	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	1st Video IF Decoupling
C26	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	Decoupling
C27	240	500	512532	1469-00025	TCZ-240	5R5T25		MS-325	Fixed Trimmer
C28	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	1st Video IF Fil.
C29	82		513016	SI82	TCZ-82	5W5T1	GP1K-820	19C11	IF Coupling
C30	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	AGC Filter
C31	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	2nd Video IF Decoupling
C32	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	2nd Video IF Fil.
C33	82		513016	SI82	TCZ-82	5W5T1	GP1K-820	19C11	IF Coupling
C34	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	AGC Filter
C35	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	3rd Video IF Decoupling
C36	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	3rd Video IF Fil.
C37	82		513016	SI82	TCZ-82	5W5T1	GP1K-820	19C11	IF Coupling
C38	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	4th Video IF Decoupling
C39	1000		513009	SI1000	D6-102	1W5D1	GP2L-102	19C1	4th Video IF Fil.
C40	5		513432	SI15NPO	TCZ-4.7	5W5V5	NPOK-050	MS-55	Video Det. Filter
C41	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Video Det. - DC Rest. Fil.
C42	.25	200	512045	P488-25		GT2P25		2TM-P25	Video Amp. Screen
C43	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	AGC Filter
C44	.25	200	512045	P488-25		GT2P25		2TM-P25	AGC Filter
C45	100		513003	SI100	D6-101	5W5T1	GP1K-101	19C11	Video Coupling
C46	.1	200	512003	P288-1	DF-104	PTE4P1		2TM-P1	Video Coupling
C47	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	Video Coupling
C48	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C49	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C50	.02	600	512019	P688-02	DF-203	PTE6S2		6TM-S2	Vert. Sweep Coupling
C51	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Integrator Cap
C52	2.2		513001		TCZ-2.2				Sound IF Coupling
C53	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st Sound IF Decoupling

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C54	5000		513013	BPD-005	DD-502	1DSD5	811-005	29C1	RF Bypass
C55	5000		513013	BPD-005	DD-502	1DSD5	811-005	29C1	1st Sound IF Decoupling
C56	1000		517009	SII000	D6-102	1WSD1	GP2L-102	19C1	1st Sound IF Fil.
C57	47		513477	SI47	D6-470	5WSQ5	GP1K-470	19C25	Sound IF Coupling
C58	220		513018	SI220	D6-221	5WST25	GP2K-221	19C13	RF Bypass
C59	5000		513013	BPD-005	DD-502	1DSD5	811-005	29C1	2nd Sound IF Decoupling
C60	5000		513013	BPD-005	DD-502	1DSD5	811-005	29C1	2nd Sound IF Fil.
C61	1000		513009	SI1000	D6-102	1WSD1	GP2L-102	19C1	Sound IF Coupling
C62	1500		513010	SI1500	D6-152	1WSD15	GP2L-152	29C8	RF Bypass
C63	220	500	512527	P468-00025	D6-221	5WST25	GP2K-221	1FM-325	Diode Load Cap
C64	1500		513010	SI1500	D6-152	1WSD15	GP2L-152	29C8	De-emphasis
C65	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C66	.005	600	512007	P688-005	D6-502	PTF6D5	811-005	6TM-D5	Tone Comp.
C67	.005	600	512007	P688-005	D6-502	PTF6D5	811-005	6TM-D5	Audio Coupling
C68	.005	600	512007	P688-005	D6-502	PTF6D5	811-005	6TM-D5	Audio Coupling
C69	270		513006	SI270	D6-271	5WST25	GP2K-271	19C35	AF Amp. Plate
C70	.01	600	512013	P688-01	D6-102	PTE6S1	821-01	6TM-S1	Tone Comp.
C71	.002	600	512003	P688-002	D6-202	PTE6S2	GP2-333-202	6TM-D2	Audio Output Plate
C72	25	600	512045	684-25		GP6P25		6TM-P25	Sync. Coupling
C73A	10000	*	508062	P688-01		PTE8S1	GP2-333-103	6TM-S1	Vert. Sync. Coupling
B	2000			P688-002	PC 100	PTF6D2	GP2-333-202	6TM-D2	Integrator Net
C	5000			P688-005	DD-103	PTE6D5	GP2-333-502	6TM-D5	Integrator Net
D	5000			P688-005		PTE6D5	GP2-333-502	6TM-D5	Integrator Net
C74	4700	1000	512533	1467-005	D6-472	.DSD5	GP2-333-472	1FM-25	Vert. Osc. Grid Cap
C75	.1	600	512037	P568-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C76	.05	600	512306	P688-05	DF-503	PTE6S5		6TM-S5	Vert. Discharge
C77	1000		513009	SI1000	D6-102	1WSD1	GP2L-102	19C1	Horiz. Sync. Coupling
C78	1000		513009	SI1000	D6-102	1WSD1	GP2L-102	19C1	Horiz. Sync. Coupling
C79	.01	600	512013	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Horiz. AFC Filter
C80	.05	600	512021	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Feedback
C81	5000		513013	BPD-005	DD-502	1DSD5	811-005	29C1	Horiz. AFC Filter
C82	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	Horiz. AFC Filter
C83	3900	500	512540	1464-004		1DR5D4	GP2-333-402	MS-24	Fixed Trimmer
C84	330	500	512549	1468-00035	D6-331	5WST3	GP2K-331	1FM-335	Horiz. MV Feedback
C85	390	500	512535	1469-0004	D6-391	5WST4	GP2K-391	MS-34	Horiz. Discharge
C86	270	500	512536	1468-00025	D6-271	5WST25	GP2K-271	1FM-325	Horiz. Sweep Coupling
C87	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C88	3.3		513025				NPOK-3R3		Horiz. Feedback
C89	.003	600	512005	P688-003	D6-302	PTE6D3	GP2-333-302	6TM-D3	Fixed Trimmer *
C90	.1	600	512037	P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling
C91	.05	600	512031	P688-05		PTE6S5		6TM-S5	Damper Filter
C92	.05	600	512039	P688-05		PTE6S5		6TM-S5	Damper Filter
C93	500	20000	518888	HV30C	TV2-502			HV Filter	
C94	.01	400	512555	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C95	.01	400	512255	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C96	.02								Vert. Discharge Cap †

* Items C73A, C73B, C73C, C73D, R72A, R72B, R72C are combined in one unit.
† Models with letter "H" not included in series designation use 220MMFD. Mfgrs. part number 513018.
• Used in models having letter "F" included in series designation.
‡ Connected in parallel with C76 in chassis with letter "C" included in series designation.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg		508182	Q13-137X	AK-98-Z		Volume Control - Tapped ② 250KΩ
B	Shaft		Not req.	RQ	FKS-1.4		Attach to R1A Per Instructions
C	Switch		Not req.	76-1	SWB		Attach to R1A Per Instructions
R2A	50KΩ	1	508889	Q11-123	AG-44-S	AN-31	Brightness Control
B	Shaft		Not req.	Not req.	RS-2	AK-4	Attach to R2A Per Instructions
R3A	2.5Meg		508893				Height Control - Front
B	1Meg						Vertical Hold Control - Rear
R4A	50000Ω	1	508891	Q11-114	AM-19-S	AN-10	Vertical Linearity Control
B	Shaft		Not req.	Not req.	RS-2	AK-4	Attach to R4A Per Instructions
R5A	3000	2	509076				Contrast Control - Wire Wound - Front
B	500KΩ						Tone Control - Rear

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R6	39KΩ	1	510147	BTS-3900	Antenna Coil Shunt
R7	68KΩ 20%	1		BTS-68K	AGC Network - See Note 1
R11	22Ω	1	510143	BTS-2200	RF Amp. Decoupling
R9	10KΩ	1	510155	BTS-10K	RF Coil Shunt
R10	47000Ω	1	510149	BTS-4700	Mixer Grid
R11	220KΩ 20%	1	510179	BTS-220K	Mixer Grid
R12	15KΩ 20%	1	510158		Mixer Plate
R13	10KΩ	1	510155	BTS-10K	Osc. Grid
R14	4700Ω	1	510149	BTS-4700	Osc. Plate
R15	10000Ω 20%	1	510137	BTS-10000	AGC Network
R16	6800Ω	1	510161	BTS-6800	1st Video IF Amp. Grid - See Note 3
R17	270Ω	1	510126	BTS-270	1st Video IF Amp. Cathode - See Note 4
R18	100Ω	1	510107	BTS-100	1st Video IF Amp. Decoupling
R19	10000Ω 20%	1	510137	BTS-10000	AGC Network
R20	820Ω	1	510153		2nd Video IF Amp. Grid
R21	82Ω	1	510107	BTS-82	2nd Video IF Amp. Cathode
R22	1000Ω	1	510137	BTS-1000	2nd Video IF Amp. Decoupling
R23	1000Ω	1	510137	BTS-1000	AGC Network
R24	8200Ω	1	510153	BTS-8200	3rd Video IF Amp. Grid - See Note 7
R25	82Ω	1	510107	BTS-82	3rd Video IF Amp. Cathode
R26	1000Ω	1	510137	BTS-1000	3rd Video IF Amp. Decoupling
R27	5800Ω	1	510151	BTS-5800	4th Video IF Transformer Shunt - See Note 5
R28	1000Ω 20%	1	510139	BTS-1000	4th Video IF Amp. Cathode
R29	1000Ω 20%	1	510137	BTS-1000	4th Video IF Amp. Decoupling
R30	8200Ω	1	510153	BTS-8200	5th Video IF Transformer Shunt
R31	4700Ω	1	510148	BTS-4700	Video Det. Diode Load - See Note 6
R32	33KΩ	1	510164	BTS-33K	Keyed AGC Grid
R33	100KΩ 20%	1	510173	BTS-100K	AGC Network
R34	10KΩ 20%	1	510155	BTS-10K	AGC Network
R35	82000Ω	1	510253	BTA-8200	Video Amp. Screen
R36	5600Ω	1	510150	BTS-5600	Video Amp. Plate
R37	5600Ω	1	510150	BTS-5600	Video Amp. Plate
R38	47KΩ	1	510166	BTS-47K	Video Peaking Coil Shunt
R39	15KΩ	1	510257	BTA-15K	Voltage Divider
R40	1Meg 20%	1	510191	BTS-1Meg	Cathode Follower Grid

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA FIRESTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R41	12KΩ	2	510258	BTB-12K	Cathode Follower Cathode
R42	1Meg 20%	1	510191	BTS-1Meg	Video Output Grid
R43	270Ω	1	510126	BTS-270	Video Output Cathode
R44	1500Ω	2	510339	BTB-1500	Video Output Plate
R45	1500Ω	2	510339	BTB-1500	Video Output Plate
R46	12KΩ 5%	1	510723	BTS-12K-5%	Video Peaking Coil Shunt
R47	12KΩ 5%	1	510723	BTS-12K-5%	Isolation
R48	1Meg	1	510191	BTS-1Meg	DC Restorer Diode Load
R49	2200Ω 20%	1	510143	BTS-2200	Vert. Retrace Blanking Network
R50	82KΩ	1	510171	BTS-82K	Voltage Divider
R51	18KΩ	1	510159	BTS-18K	Voltage Divider
R52	100KΩ 20%	1	510173	BTS-100K	Picture Tube Grid
R53	22KΩ 20%	1	510161	BTS-22K	Picture Tube Cathode
R54	82Ω	1	510117	BTS-82	1st Sound IF Amp. Cathode
R55	1000Ω 20%	1	510137	BTS-1000	1st Sound IF Amp. Decoupling
R56	470KΩ	1	510185	BTS-470K	2nd Sound IF Amp. Grid
R57	82Ω	1	510117	BTS-82	2nd Sound IF Amp. Cathode
R58	1000Ω 20%	1	510137	BTS-1000	2nd Sound IF Amp. Decoupling
R59	18KΩ	1	510159	BTS-18K	Ratio Det. Diode Load
R60	18KΩ	1	510159	BTS-18K	Ratio Det. Diode Load
R61	22KΩ	1	510160	BTS-22K	De-emphasis
R62	68KΩ	1	510170	BTS-68K	Tone Compensation
R63	10Meg	1	510197	BTS-10Meg	AF Amp. Grid
R64	470KΩ	1	510185	BTS-470K	AF Amp. Plate
R65	330Ω	1	510237	BTA-330	Output Cathode
R66	8200Ω	1	510153	BTS-8200	Decoupling
R67	560KΩ	1		BTS-560K	Sync. Sep. Grid - See Note 2
R68	330KΩ	1	510181	BTS-330K	Sync. Sep. Plate
R69	1800Ω 5%	1	510739	BTS-1800-5%	Sync. Amp. - Phase Inv. Cathode
R70	1800Ω 5%	1	510739	BTS-1800-5%	Sync. Amp. - Phase Inv. Plate
R71	1800Ω 5%	1	510739	BTS-1800-5%	Sync. Amp. - Phase Inv. Plate
R72A	22KΩ		508062 •	BTS-22K	Integrator
B	8200Ω			BTS-8200	Integrator
C	8200Ω			BTS-8200	Integrator
R73	1.5Meg 5%	1	510721	BTS-1.5Meg-5%	Vert. Osc. Grid
R74	1.2Meg	1	510738	BTS-1.2Meg	Vertical Osc. Plate
R75	6.8Meg	1	510196	BTS-6.8Meg	Voltage Divider
R76	100KΩ	1	510173	BTS-100K	Voltage Divider
R77	6800Ω	1	510151	BTS-6800	Vertical Peaking
R78	2.2Meg	1	510193	BTS-2.2Meg	Vertical Output Grid
R79	680Ω	1	510133	BTS-680	Vertical Output Cathode
R80	3000Ω 5%	2	510713		Decoupling
R81	100KΩ 20%	1	510173	BTS-100K	Horizontal Phase Det. Diode Load
R82	100KΩ 20%	1	510173	BTS-100K	Horizontal Phase Det. Diode Load
R83	4.7Meg	1	510196	RTS-4.7Meg	Horizontal Phase Det. Diode Load
R84	27KΩ	1	510163	BTS-27K	Horizontal Phase Det. Diode Load
R85	470KΩ 20%	1	510185	BTS-470K	Horizontal AFC Fliter
R86	1500Ω	1	510139	BTS-1500	Horizontal MV Cathode
R87	3900Ω	1	510147	BTS-3900	Horizontal MV Plate - See Note 8
R88	100KΩ	1	510173	BTS-100K	Horizontal MV Grid
R89	270KΩ	1	510180	BTS-270K	Horizontal MV Plate
R90	68Ω 20%	1	510116		Parasitic Suppressor
R91	470KΩ	1	510184	BTS-470K	Horizontal Output Grid
R92	220Ω	5	510176	1 3/4A-225	Horizontal Output Cathode - Wire Wound
R93	12KΩ	2	510356	BTB-12K	Horizontal Output Screen
R94	12KΩ	2	510356	BTB-12K	Horizontal Output Screen
R95	10KΩ	1	510254	BTA-10K	Horizontal Feedback
R96	68Ω	1	510133	BTS-680	Damping
R97	3.3Ω	1	510725		HV Rectifier Filament
R98	1Meg 20%	2	510391		HV Filter
R99	7500Ω	5	510727	1 3/4A-7500	Voltage Divider - Wire Wound
R100	1000Ω	10	510754	1 3/4A-1000	Filter - Wire Wound
R101	600Ω	10	510741	1 3/4A-600	Voltage Dropping - Wire Wound
R102	850Ω	5	510726		Filter - Wire Wound
R103	100Ω 20%	2	510319		Surge Limiter
R104	4.3Ω	1	510704	BW-1-4.3	Pilot Light Dropping - Wire Wound
R105	4.3Ω	1	510704	BW-1-4.3	Pilot Light Dropping - Wire Wound
R106	220KΩ 20%	1	510179	BTS-220K	Isolation
R107	33KΩ	1	510163	BTS-33K	Limiter Grid

* Items R72A, R72B, R72C, C73A, C73B, C73C and C73D are combined into one unit.
Note 1. Some models use 47KΩ resistor in this application.
Note 2. Some models use 270KΩ resistor in this application.
Note 3. Some models use series resistors in this application to obtain desired value.
Note 4. Some models use 82Ω resistor in this application.
Note 5. Some models use 8200Ω resistor in this application.
Note 6. Some models use 6800Ω resistor in this application.
Note 7. Some models use 47000Ω resistor in this application.
Note 8. Some models use 5600Ω resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC ⓐ 2.1A	680VCT .230ADC	400VCT .075ADC	5VAC ⓐ 3A SEC. 4 6.3VAC ⓐ 10.4A	508702		P-3067 ①	

① Add series resistor to reduce plate voltage.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	153Ω	940Ω	508076	A-8111 ②	A-3000 ②	TB0-1 ②	Vert. Block Osc. Trans.
T3	420Ω Tap 44Ω	7.2Ω Tap 4.9Ω SEC. 2	508679				Horizontal Output Trans.
T4	1.1KΩ Tap 13Ω	0Ω	508956	A-8123	A-3037 ②		Vertical Output Trans.
T5A	13Ω		508675	DY-7	MDF-70		Horizontal Deflection Coil
B	49Ω						Vertical Deflection Coil

② Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	6KΩ	3.5Ω	630Ω	.9Ω	505912	A-3823	A-3019	RO-9 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD. RES.	RATINGS V. C. IMP.	REPLACEMENT DATA FIRESTONE PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	PM	3.5Ω	508174	69J9	99A2	
	CONE DIA.	V. C. DIA.				
SP2	6"X9"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	INDUCTANCE @ CURRENT 1000 m/l	REPLACEMENT DATA FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.230A	73Ω	2.9 Henries	508341	C-2325	C-2991 ②	TR3300 ②	② Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA FIRESTONE PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L2	Antenna Coil	0Ω	0Ω	507963			Channel # 13
L3	Fil. Choke	0Ω		507970			
L4	RF, Mixer Grid and Osc. Coil	0Ω		507983			Channel # 13
L5	Fil. Choke	0Ω		507971			
L6	1st Video IF	.8Ω		509081			
L7	Fil. Choke	0Ω		507584			
L8	Sound Atten. Trap	0Ω		509056			
L9	2nd Video IF	.1Ω		507343			
L10	3rd Video IF	.1Ω		507343			
L11	Fil. Choke	0Ω		507584			
L12	4th Video IF	.1Ω		507343			
L13	RF Choke	2.4Ω		507367			
L14	Fil. Choke	.22Ω		507587		CLA	.47 Microhenry
L15	5th Video IF	.1Ω	2.2Ω	507591			Complete Assembly
L16	Fil. Choke	.8Ω		507586		CLA	1 Microhenry
L17	Peaking	26Ω		507374			
L18	Peaking	26Ω		507374			
L19	Peaking	4.5Ω		508069			Green Dot
L20	Peaking	5.5Ω		508070			
L21	1st Sound IF	1.9Ω	1.9Ω	508061			
L22	RF Choke	15Ω		507373			Red Dot
L23	2nd Sound IF	1.9Ω	1.9Ω	508061			
L24	Fil. Choke	.8Ω		507586		CLA	1 Microhenry
L25	Disc. Trans.	6Ω	.1Ω	507321			Tap .8Ω
L26	RF Choke	15Ω		507373			Blue Dot
L27	Horiz. Hold	90Ω		508967			
L28	Horiz. Width	26Ω	40Ω	508667			
L29	Damping Coil	5 Ω		509615			
L30	Horiz. Lin.	4Ω		162190			

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA FIRESTONE PART No. FUSE	FIRESTONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	REMARKS
M1	3AG	.250	508715	508174	312.250	155020	④ Used when letter "D" is included in series designation at rear of chassis.
M2	3AG	1 Amp. PigTail	508517 ④		318001		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA FIRESTONE PART No.	NOTES
M3	Bayonet	6-8	.15	Brown	118921	Type No. 47 (TV)
M4	Bayonet	6-8	.15	Brown	118921	Type No. 47 (AM-FM)
M5	Bayonet	6-8	.15	Brown	118921	Type No. 47 (On-Off)

MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M6	RF Tuner	508890	
M7	Switch	509075	Function Selector Assembly (Complete-Includes Volume Control)
M8	Focus Magnet	509595	
M9	Ion Trap	508603	
B1	Trimmer	508071	Horizontal Drive (10-160MMF)
	Trimmer	508324	Built-In Antenna Tuning (4-70MMF)
	Antenna Coil	507952	Channel 2
		507953	Channel 3
		507954	Channel 4
		507955	Channel 5
		507956	Channel 6
		507957	Channel 7
		507958	Channel 8
		507959	Channel 9
		507960	Channel 10
		507961	Channel 11
		507962	Channel 12
	RF, Mixer Grid and Osc. Coil	507972	Channel 2
		507973	Channel 3
		507974	Channel 4
		507975	Channel 5
		507976	Channel 6
		507977	Channel 7
		507978	Channel 8
		507979	Channel 9
		507980	Channel 10
		507981	Channel 11
		507982	Channel 12
	Knob	509111	AM-FM Coarse Tuning And Dial Scale
	Knob	509102	AM-FM Fine Tuning
	Knob	502563	Built-In Antenna
	Knob	509101	Channel Selector
	Knob	508209	Contrast
	Knob	509109	TV Fine Tuning
	Knob	509107	Tone
	Knob	508208	TV Phono AM-FM
	Knob	509108	On/Off Volume

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V27	FM RF Amplifier - FM Mixer	12AT7	12AT7	9A	
V28	FM Oscillator - AM Converter	6BE6	6BE6	7CH	
V29	1st FM-AM IF Amp.	6BA6	6BA6	7BK	
V30	2nd FM. IF Amp. - AM Detector-AVC	6BA6	6BA6	7BK	
V31	Ratio Detector -AVC	6AL5	6AL5	6BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C97	3	50	507946	PRS150/4		BR415		TVA-1303	Stabilizing Cap
C98	10		513023	SII0	D6-100	5W5Q1	GP1K-10	19C19	FM Ant. Coupling
C99	1000		513009	SII000	D6-102	1W5D1	GP2L-102	19C1	FM RF Amp. Grid
C100	1000		513009	SII000	D6-102	1W5D1	GP2L-102	19C1	FM RF Amp. Fil.
C101	330		513007	SI330	D6-331	5W5T3	GP2K-330	19C14	RF Coupling
C102	1000		513009	SII000	D6-102	1W5D1	GP2L-102	19C1	RF Coupling
C103	1		513000		TCZ-1				Osc. Coupling
C104	47		513002	SI47	D6-470	5W5Q5	GP1K-47	19C25	FM Osc. Grid Cap
C105	47		513002	SI47	D6-470	5W5Q5	GP1K-47	19C25	FM Osc. Grid Cap
C106	2.5		513436						Osc. Feedback
C107	2.2		513001		TCZ-2.2				FM Osc. Feedback
C108	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	AM Conv. -FM Osc. Dec.
C109	1000		513009	SII000	D6-102	1W5D1	GP2L-102	19C1	AM Conv. -FM Osc. Fil.
C110	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Amp. Decoupling
C111	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Amp. Fil.
C112	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C113A	100		†506338	SII00	PC50 †	5W5T1	GP1K-100	19C11	AM Det. RF Filter
B	100			SII00		5W5T1	GP1K-100	19C11	AM Det. RF Filter
C114	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C115	.05	400	512028	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C116	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	FM IF Amp. Decoupling
C117	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	FM IF Amp. Fil.
C118	330		513007	SI330	D6-331	5W5T3	GP2K-330	19C14	RF Bypass
C119	330		513007	SI330	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap
C120	.001	400	512103	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	De-emphasis
C121	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Ratio Det. Fil.

† Items C113A, C113B and R119 are included in one unit.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FIRESTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R108	100KΩ	1/2	510173		FM RF Amp. Grid
R109	2.2Meg	1/2	510193		FM Mixer Grid
R110	6800Ω	1/2	510152	BTS-6800	Decoupling
R111	10KΩ	1/2	510155		FM Osc. Grid
R112	4700Ω	1	510249	BTA-4700	Decoupling
R113	3300Ω	1/2	510146	BTS-3300	1st IF Amp. Decoupling
R114	3300Ω	1	510246	BTA-3300	Decoupling
R115	1500Ω	1	510240	BTA-1500	2nd FM IF Amp. Decoupling
R116	10KΩ	1/2	510155	BTS-10K	Ratio Det. Diode Load
R117	10KΩ	1/2	510155	BTS-10K	Ratio Det. Diode Load
R118	220Ω	1/2	510125	BTS-220	Balancing
R119	18KΩ	1/2	510159	BTS-18K	De-emphasis
R120	47KΩ	1/2	506338 †	BTS-47K	Diode Filter
R121	470KΩ	1/2	510185	BTS-470K	Diode Load
R122	2.2Meg	1/2	510193	BTS-2.2Meg	AVC Network

† Items R119, C113A and C113B are combined into one unit.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: FIRESTONE PART No.	REPLACEMENT DATA: MEISSNER PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
L31	RF Choke	.8Ω		507586		CLA	1 Microhenry
L32	RF Choke	3Ω		507935		CLA	3.3 Microhenries
L33	FM RF Coil	0Ω		507941			
L34	FM Osc.	0Ω		507942			
L35	Loop Ant.	.3Ω		508212			
L36	AM Ant. Coil	.2Ω	2.2Ω	508184			
L37	AM Osc.	8Ω		508195			Tap .8Ω
L38	RF Choke	0Ω		506581			Wound on 1KΩ Resistor
L39	1st FM IF	.6Ω	.6Ω	506080			
L40	1st AM IF	24Ω	24Ω	505867			
L41	2nd FM IF	1.8Ω	.5Ω	505905			
L42	2nd AM IF	24Ω	24Ω	505867			
L43	Ratio Det. Trans.	1.8Ω	1Ω	508157			Tap @ 1Ω

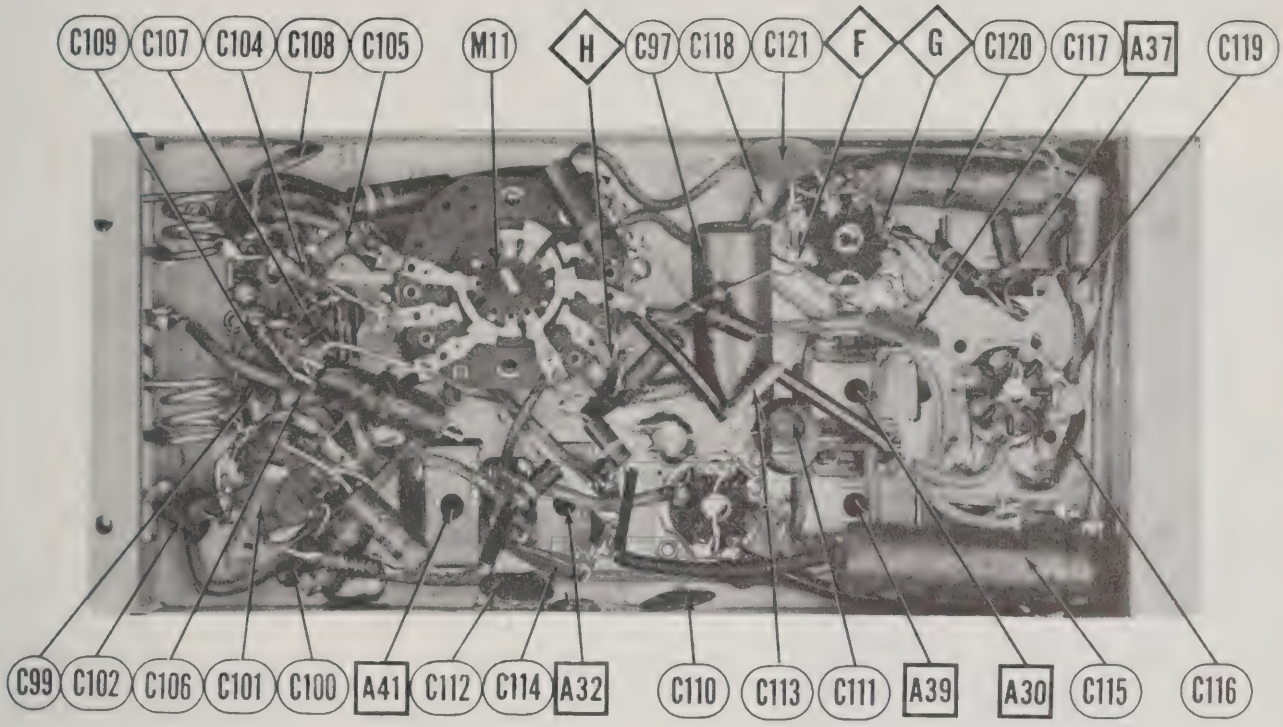
PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA: FIRESTONE PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M10	509160	GC-AG-J	G-AG	WC36B	A56U	43	0-2 Or S-2	

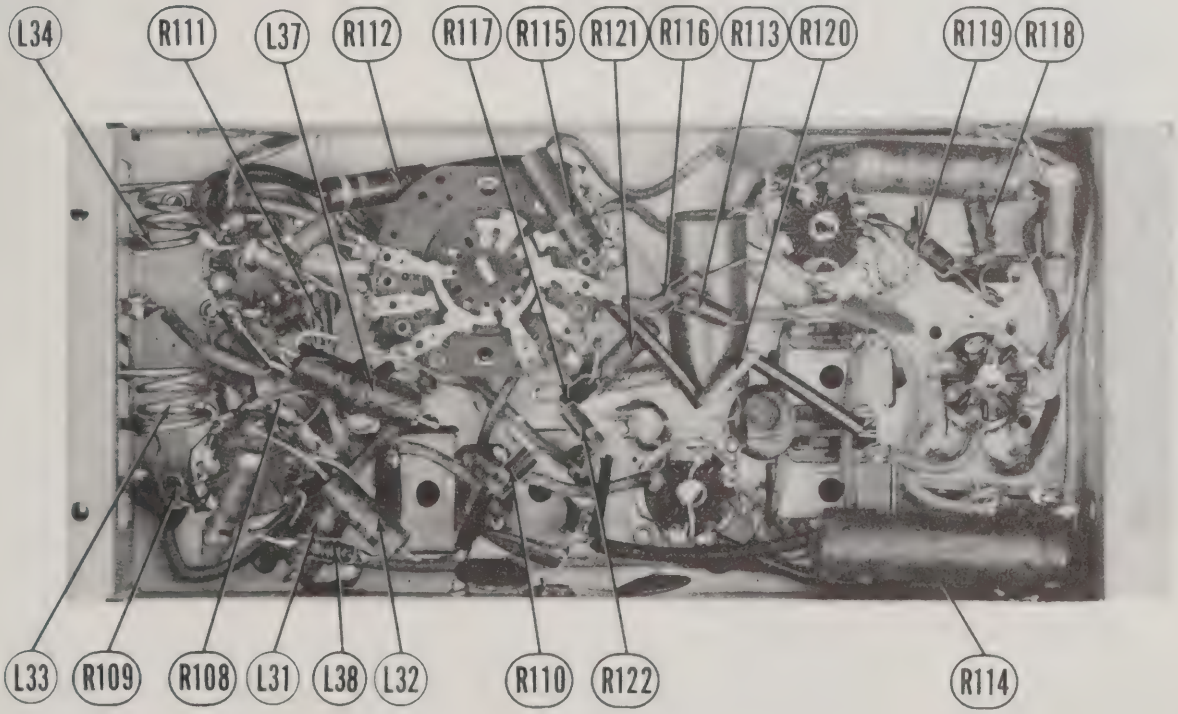
ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

MISCELLANEOUS

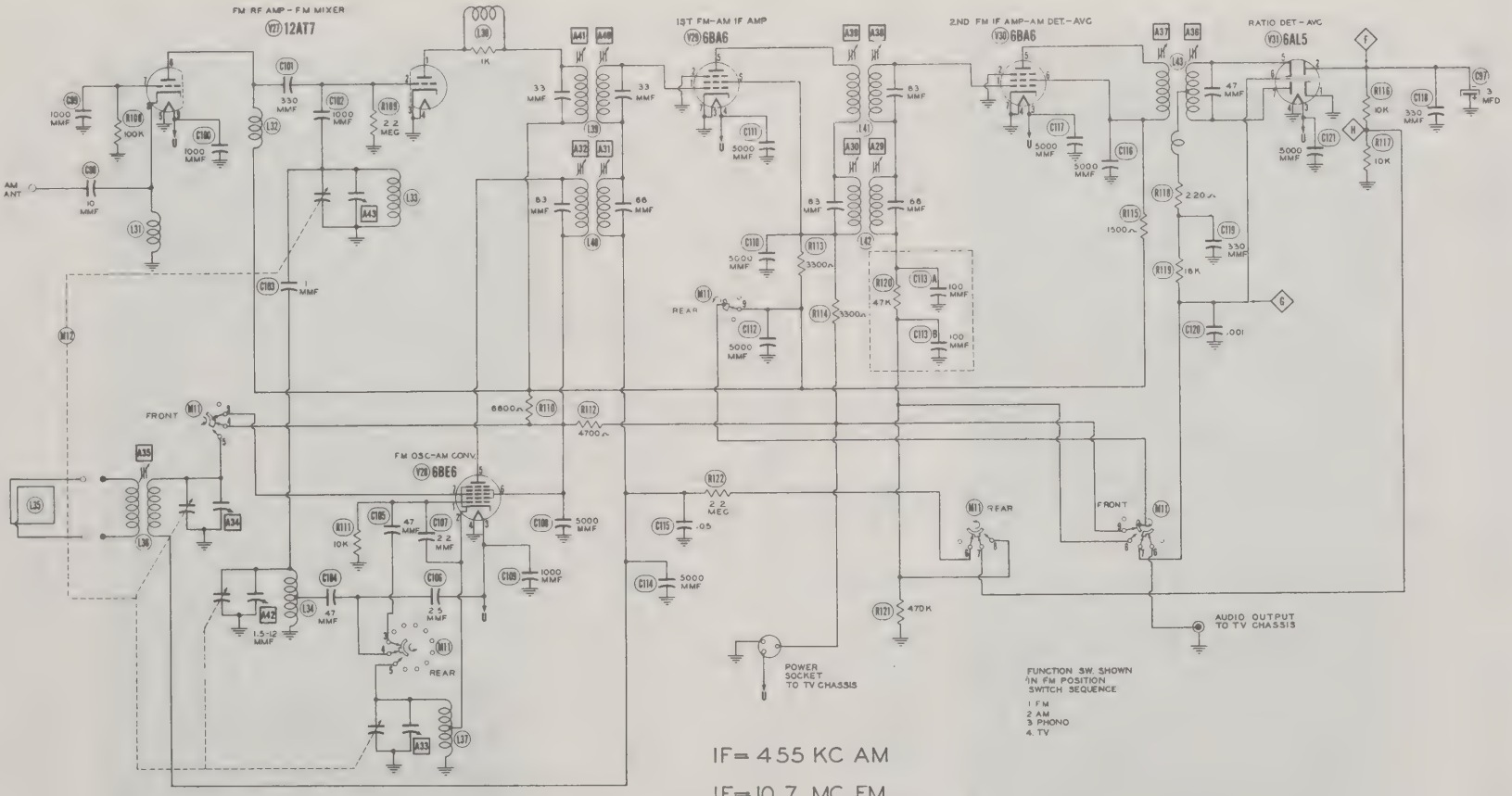
ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M11	Switch	508753	AM-FM Band Switch
M12	Tuning Cap	508729	(26-560MMF, 29-212MMF)
A42	Trimmer	507940	FM Osc. Adjustment (1.5-12MMF)



RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



RADIO CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION



FUNCTION SW. SHOWN IN FM POSITION
SWITCH SEQUENCE
1 FM
2 AM
3 PHONO
4. TV

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 27	12AT7	▲.85VDC ■14.1VDC	▲ 6VDC ■-1.8VDC	0V	0V	0V	▲.80VDC ■140VDC	▲.4VDC ■ .8VDC	0V	6.3VAC
V28	6BE6	▲ .5VDC ■ -.6VDC	0V	6.3VAC	0V	▲.100VDC ■.105VDC	▲.115VDC ■.100VDC	▲.115VDC ■.105VDC		
V29	6BA6	▲ -.5VDC ■ -.5VDC	0V	0V	6.3VAC	▲.95VDC ■.100VDC	▲.115VDC ■.105VDC	0V		
V30	6BA6	▲ -.6VDC ■ .5VDC	0V	6.3VAC	0V	▲.75VDC ■.80VDC	▲.70VDC ■.100VDC	0V		
V31	6AL5	0V	▲ -.3VDC ■ -.3VDC	6.3VAC	0V	▲ -.2VDC ■ -.2VDC	▲ -.2VDC ■ -.2VDC	▲ -.2VDC ■ -.2VDC		

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	12AT7	▲ = 4.2KΩ * ▲ = 950Ω	2.2Meg	0Ω	0Ω	0Ω ▲ = 6.7KΩ	▲ = 4.2KΩ ▲ = 950Ω	100KΩ ▲ = 6.7KΩ	7Ω	1Ω
V28	6BE6	10KΩ	.8Ω	1Ω	0Ω	▲ = 6.2KΩ ▲ = 6.2KΩ	▲ = 4.2KΩ ▲ = 4.2KΩ	▲ = 6KΩ ▲ = 6KΩ		
V29	6BA6	▲ = 2.6Meg ■ = 2.2Meg	0Ω	0Ω	1Ω	▲ = 3.6KΩ ■ = 2.5KΩ	▲ = 2.6KΩ ■ = 2.6KΩ	▲ = 2.6KΩ	0Ω	
V30	6BA6	515KΩ	0Ω	1Ω	0Ω	▲ = 7KΩ ■ = 2.6KΩ	▲ = 7KΩ ■ = 2.6KΩ	▲ = 2.6KΩ	0Ω	
V31	6AL5	0Ω	2.6KΩ	1Ω	0Ω	Inf.	Inf.	Inf.		

■ MEASURED IN AM POSITION
■ MEASURED IN FM POSITION
▲ MEASURED FROM PIN 8 OF V24

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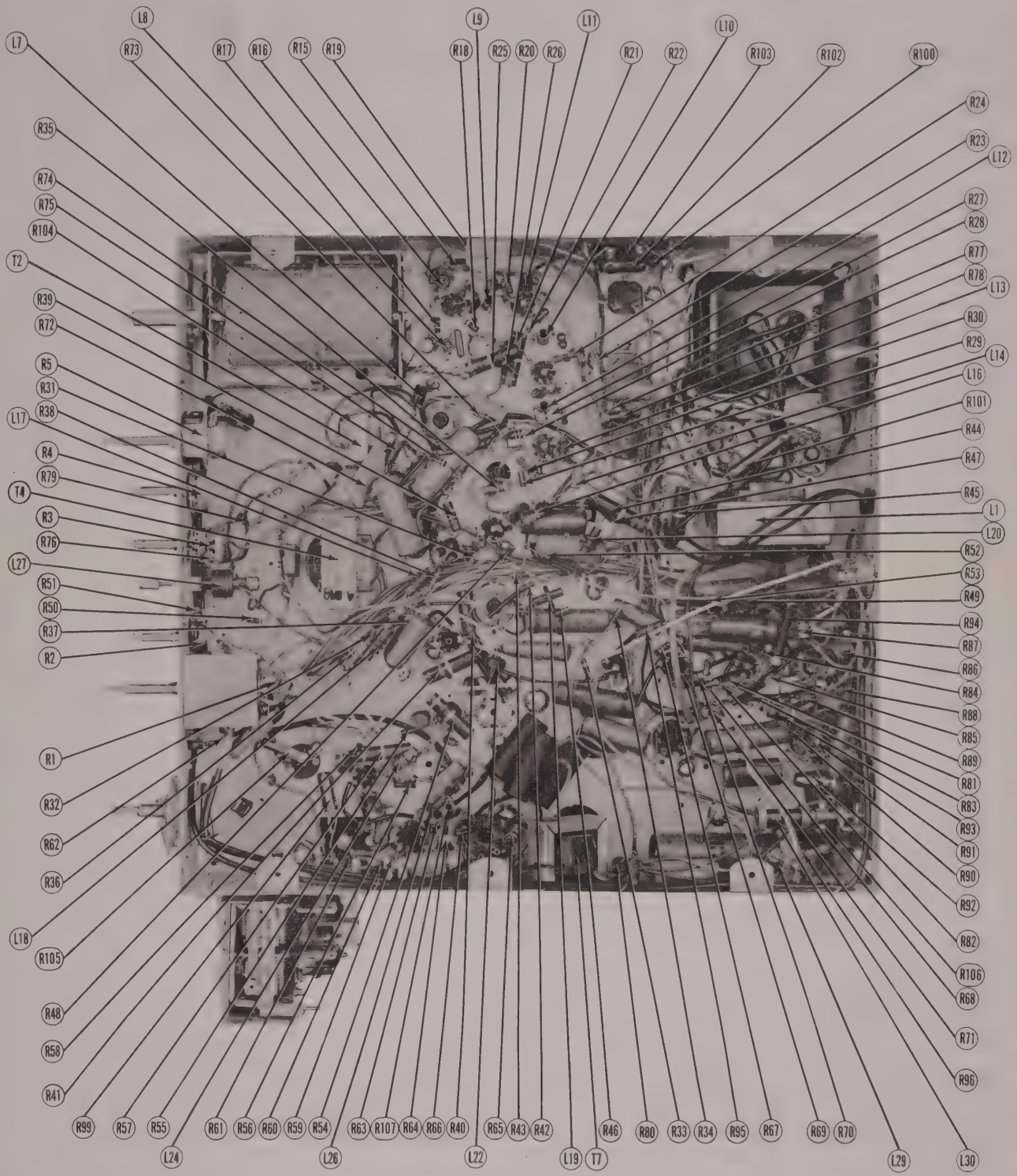
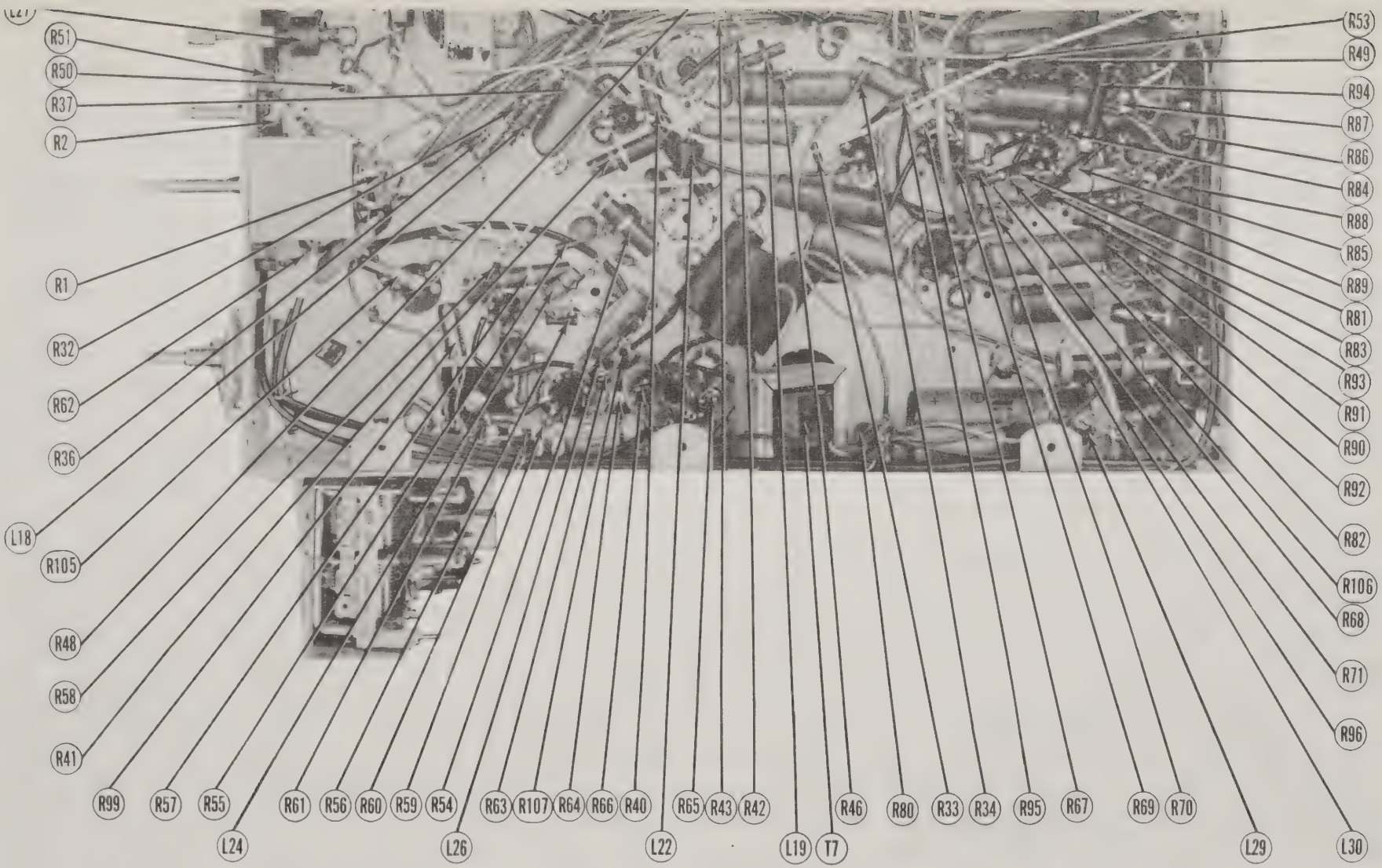
RADIO SCHEMATIC

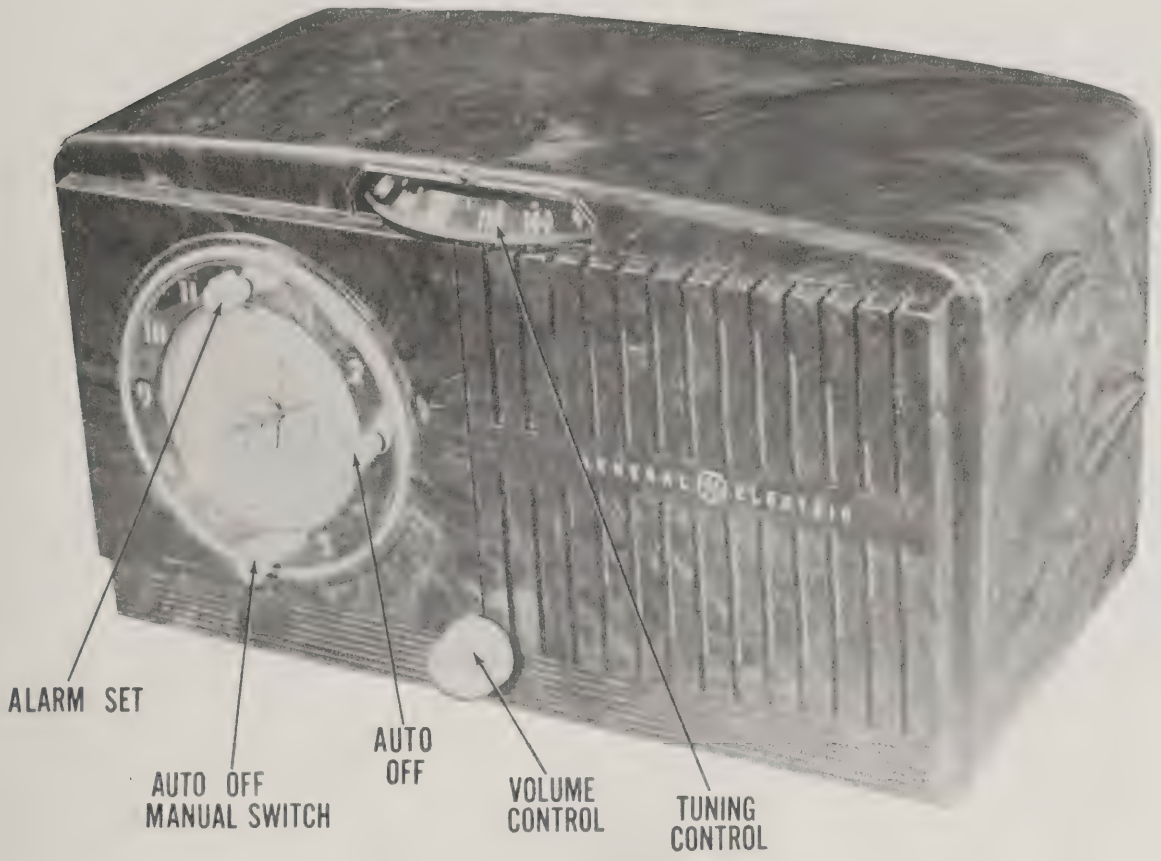


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

GENERAL ELECTRIC MODELS 510F, 511F, 512F, 513F, 515F, 516F, 517F, 518F, 521F, 522F



GENERAL ELECTRIC MODELS 510F, 511F, 512F, 513F, 515F, 516F, 517F, 518F, 521F, 522F

GENERAL ELECTRIC MODEL 515F

TRADE NAME	General Electric, Models 510F, 511F, 512F, 513F, 515F, 516F, 517F, 518F, 521F, 522F
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, New York
TYPE SET	AC Operated Superheterodyne Receiver with Electric Clock
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 DET.-AVC-AF, 50C5 Power Output
POWER SUPPLY	105-120 Volts AC 60 Cycles — RATING .25Amp. at 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD.	High side to stator on lower section of tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Adjust for maximum output.
3.		Loop	1500KC	Tune for max. output.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

GENERAL ELECTRIC
MODEL 510F

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		GENERAL ELEC PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF	12AV6	12AV6	7BT	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	50	150	RCE-127	PRS150/50-50		BRD5515A		TVA-2453	Filter
B	50	150							Filter
C2	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3	47	500	UCG-020	1469-00005	TCZ-47	5R5Q5	NP0L-470	MS-45	Osc. Grid Cap.
C4	6		RCW-3049				NP0K-060		Osc. Feedback
C5A	400		RCW-3048	1468-0004	D6-401	5W5T4			Diode RF Filter
B	.002			SI2000	D6-202	1W5D2	GP2-333-202	34C3	Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-221		AF Amp. Plate
D	.005			BPD-005	DD-502	1D5D5	811-005		Audio Coupling
C6	.0033	600	RCC-108	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Output Plate
C7	.047	600	RCC-107	P688-047	DF-503	PTE6S5		6TM-S47	Line Filter
C8	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	Line Isolation

CONTROLS

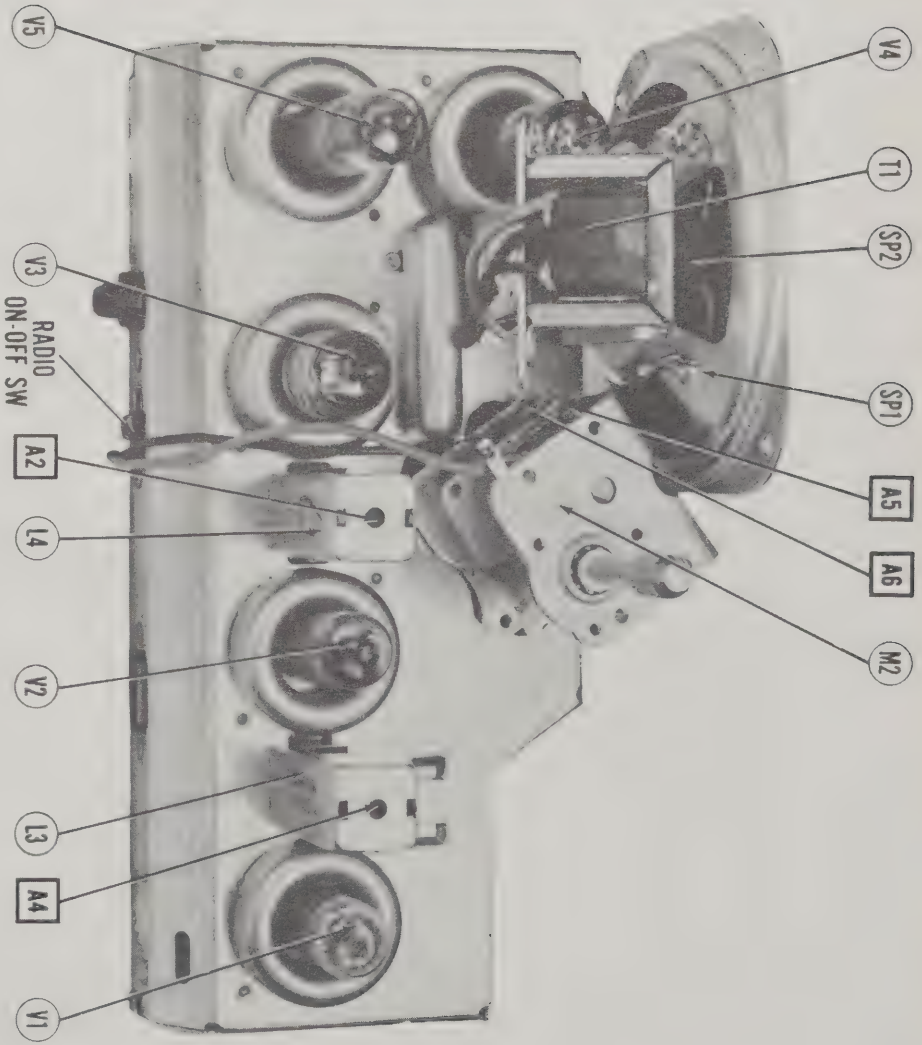
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Gen. Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	RRC-054	Q13-133	AG-60-Z	BSK-60	Volume Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	General Electric PART No.	IRC PART No.	
R2	22KΩ	½	URD-081	BTS-22K	Osc. Grid
R3	2.2Meg	½	URD-129	BTS-2.2Meg	AVC Network
R4	68Ω	½	URD-021		IF Amp. Cathode
R5	5.6Meg	½		BTS-5.6Meg	AF Amp. Grid See Note 1
R6	680KΩ	½		BTS-680K	AF Amp. Plate See Note 2
R7	680KΩ	½		BTS-680K	Output Grid See Note 2
R8	150Ω	½	URD-029	BTS-150	Output Cathode
R9	1000Ω	2	URF-049	BTB-1000	Filter
R10	22Ω	½	URD-009		Surge Limiter

Note 1 Some models use 6.8Meg Resistor in this application.
Note 2 Some models use 470KΩ Resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		General Elec.	STANCOR	MERIT	CHICAGO	
	PRI.	SEC.	PRI.	SEC.	PART No.	PART No.	PART No.	PART No.	
T1	2.6KΩ	3.9Ω	240Ω Tap15Ω	.5Ω	RTO-099		A-3031 ①	RO-3 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			GEN. ELECTRIC PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD	V. C. IMP.	S403C13	ST113 Model P4-X	4A1	
	PM	3.9Ω				
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

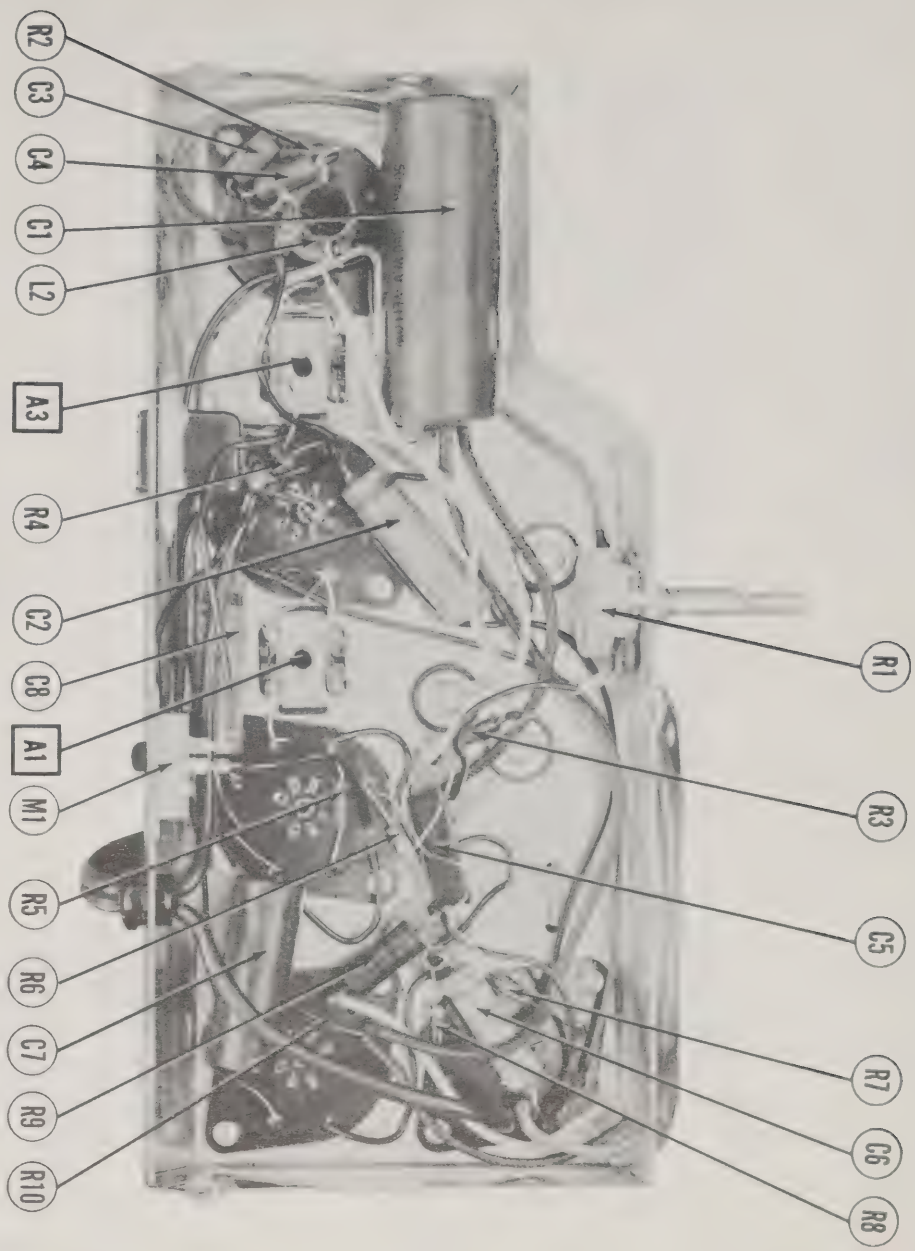
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	General Electric PART No.	MEISSNER PART No.	
L1A	Loop Ant.	3.4Ω		RAB-150		Used in Models 515F, 516F, 517F and 518F
B	Loop Ant.			RAB-149		Used in Modesl 510F and 511F
C	Loop Ant.			RAB-151		Used in Models 512F, 513F, 521F and 522F
L2	Osc. Coil	.6Ω	6.7Ω	RLC-109		
L3	1st. IF	22Ω	22Ω	RTL-117		

MISCELLANEOUS

ITEM No.	PART NAMEn	General Electric PART No.	NOTES
M1	Switch	RSW-067	Radio On-off
M2	2 Gang Var. Cap.	RCT-045	(28-470MMF, 21-192MMF)
	Cabinet	RAU-336	Model 510F (Brown)
	Cabinet	RAU-337	Model 511F (Ivory)
	Cabinet	RAU-338	Model 515F (Brown Mottle)
	Cabinet	RAU-339	Model 516F (Ivory)
	Cabinet	RAU-340	Model 517F (Maroon)
	Cabinet	RAU-341	Model 518F (White)
	Cabinet	RAU-342	Model 521F (Mahogany)
	Cabinet	RAU-343	Model 522F (Blonde)
	Cabinet	RAU-348	Model 512F (Mahogany Mottle)
	Cabinet	RAU-349	Model 513F (Antique Ivory)

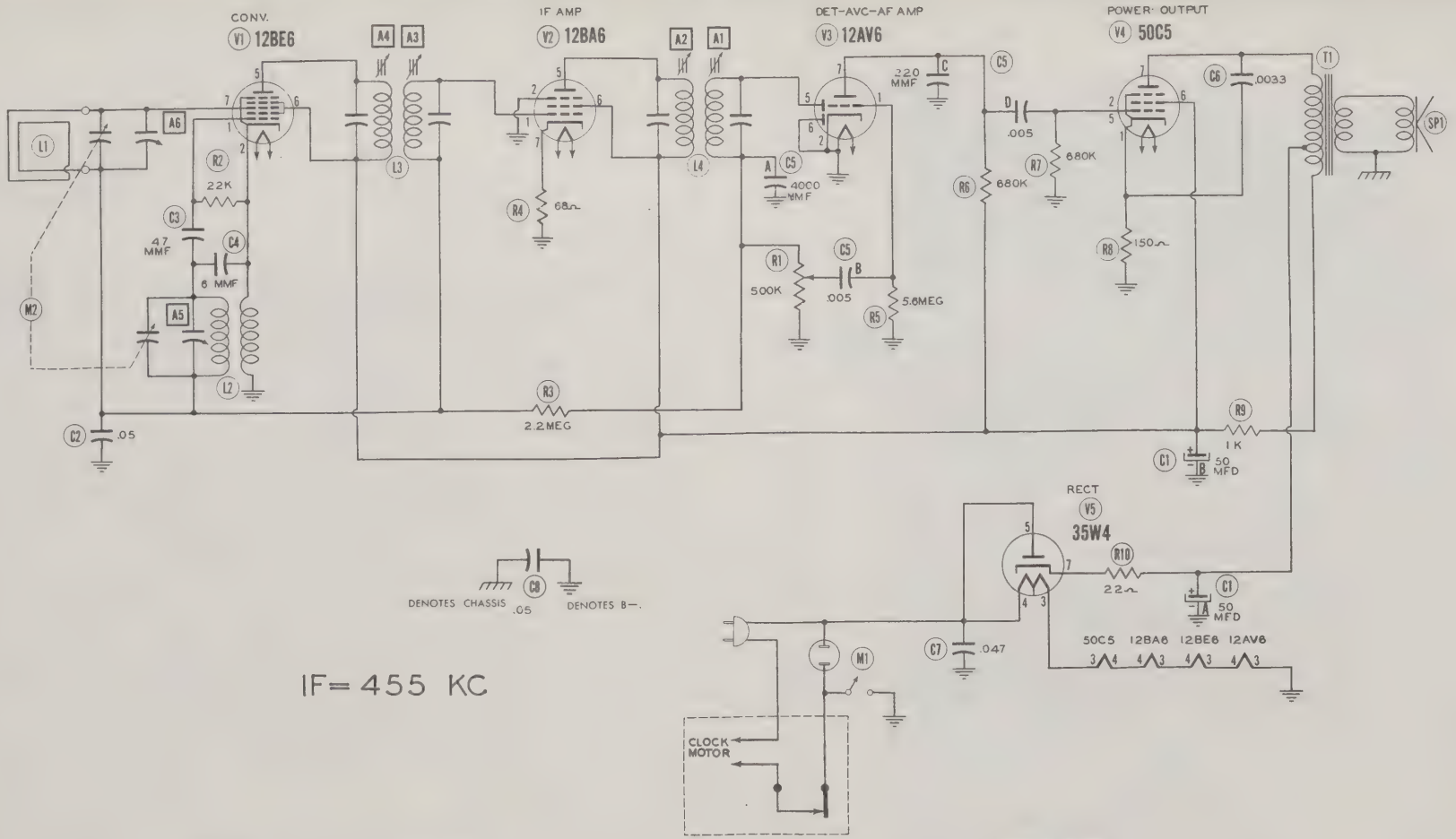
CHASSIS—BOTTOM VIEW



SET 143 FOLDER 7

GENERAL ELECTRIC MODEL 510F

GENERAL ELECTRIC MODEL 510F



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-9VDC	0V	12VAC	24AC	95VDC	95VDC	-.1VDC
V 2	12BA6	-.1VDC	0V	24VAC	35VAC	95VDC	95VDC	.9VDC
V 3	12AV6	-.4VDC	0V	0V	12VAC	-.2VDC	0V	48VDC
V 4	50C5	5.2VDC	0V	90VAC	35VAC	0V	95VDC	112VDC
V 5	35W4	120VDC	0V	90VAC	117VAC	117VAC	110VAC	120VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	12Ω	24Ω	†1KΩ	†1KΩ	2.8Meg
V 2	12BA6	2.8Meg	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	68Ω
V 3	12AV6	5.6Meg	0Ω	0Ω	12Ω	430KΩ	0Ω	†600KΩ
V 4	50C5	150Ω	680KΩ	85Ω	36Ω	680KΩ	†1KΩ	†25Ω
V 5	35W4	300KΩ	Inf.	85Ω	120Ω	120Ω	117Ω	300KΩ

† MEASURED FROM PIN 7 OF V5.

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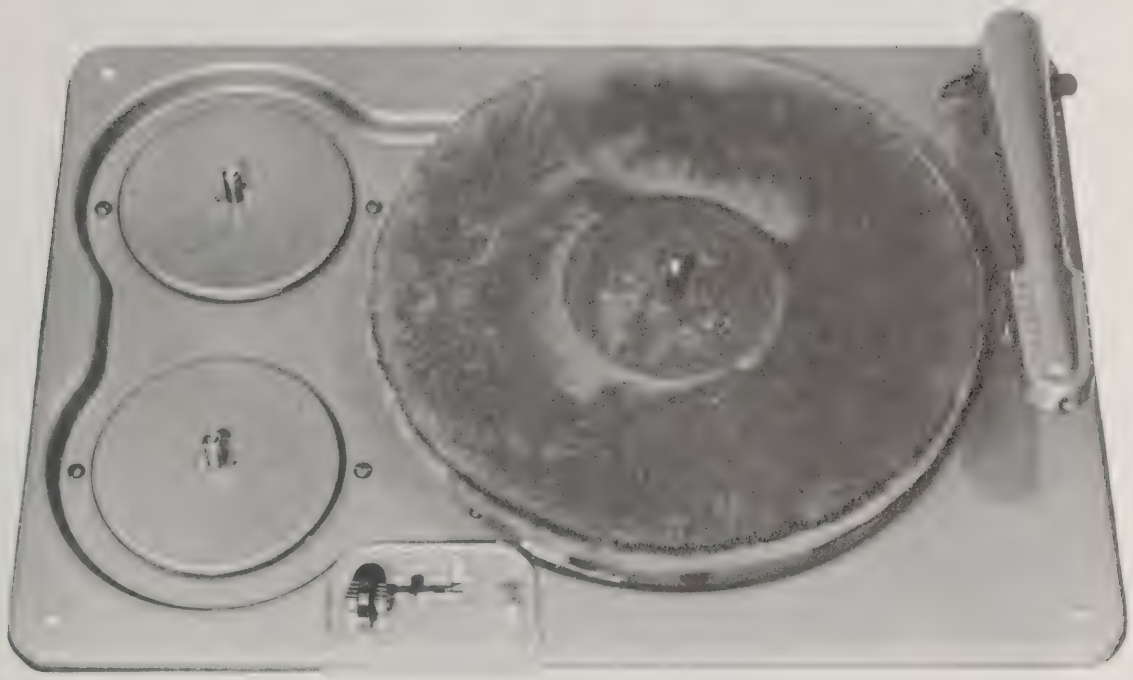
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



GENERAL INDUSTRIES
MODEL 250

GENERAL INDUSTRIES
MODEL 250

GENERAL INFORMATION

The Model 250 Tape-Disc Recorder is designed as a tape recorder, disc recorder, and record player. This mechanism is equipped with a combination pickup and cutter arm. One manual control lever is used for the purpose of shifting the mechanism to its proper position for the following operations; (A) "Off," (B) "Phono," (C) "Forward," (D) Reverse," (E) "Record," and (F) "Playback."

The Model 250 is designed for use with standard 5" reels of 1/4" tape. Either plastic or paper tape can be used. The recording tape travels past the recording head at the rate of 3.75" per second. The mechanism records on two tracks. A 5" reel of tape contains approximately 600 feet of tape, which gives a total recording time of over one hour on one reel of tape. Standard 3" reels can also be used with a proportionate decrease in recording time. Power Supply is 115 volts, A.C. 60 cycles.

Manufactured by:

The General Industries Company
Elyria, Ohio

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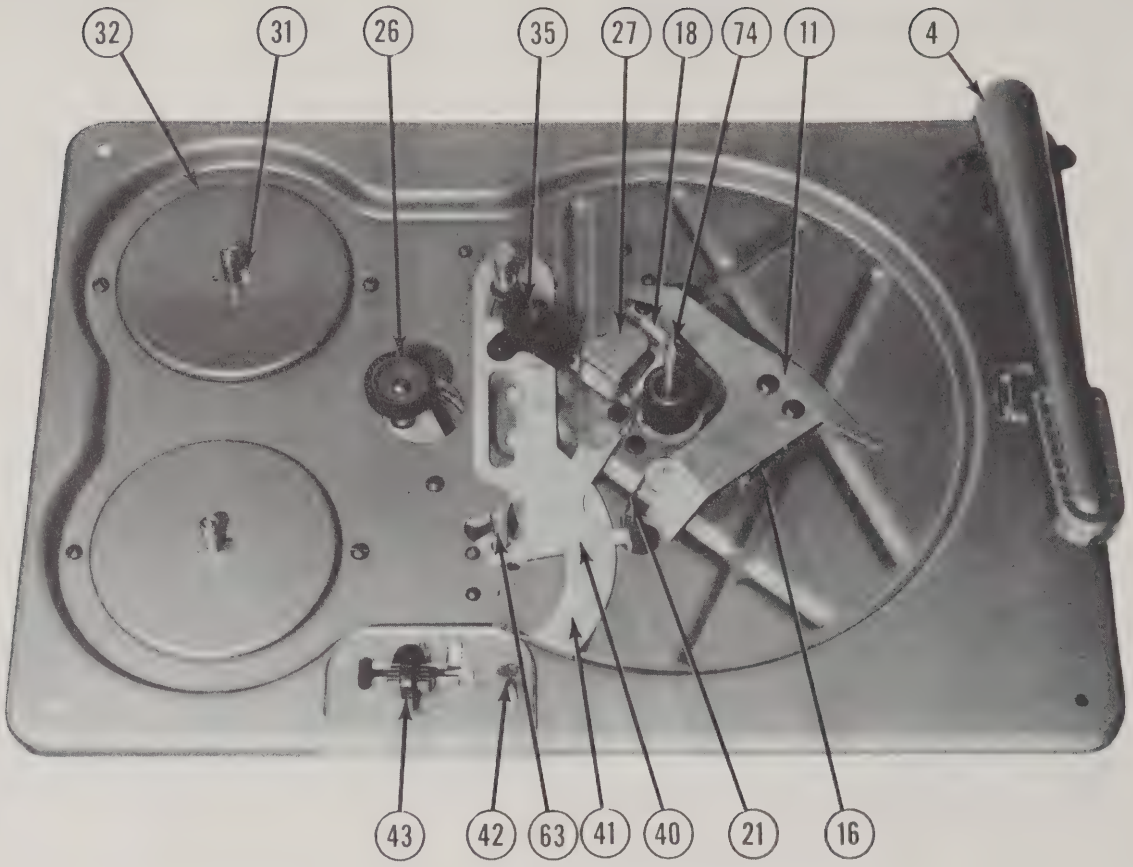


OPERATING INSTRUCTIONS

Threading of Tape -

(a) Place a reel (3" or 5" diameter) of either plastic or paper base recording tape on the rear reel pan (32) with one slot of the reel engaging key (31). Be sure the magnetic coating of the tape faces the center of the reel.

(b) Place the empty reel on the front reel pan, making sure that the slot in the reel engages the key of the spindle.

(c) Grasp the free end of the tape and unwind approximately three feet of tape. The tape is placed around the turntable and the free end is threaded into the hub of the front reel. The slack in the tape is taken up by turning the front reel clockwise. When tape is tightened, it will slide under the turntable and contact the rubber capstan (74). The recorder is now ready for operation.

Recording -

To record on the tape, move the control knob (43) forward, slightly, and then to the right, until it is aligned with the "Record" position. The control knob (43) is then pushed forward and, at the same time, the record safety button (42) is pulled forward to permit full engagement of the control knob (42) in the "Record" position.

When in the "Record" position, the erase head (35) contacts the recording tape and erases the lower track only at the instant just prior to passing over the recording head (27). Only the lower track of the tape is recorded or played back.

When the rear reel is empty and it is desired to record the upper half of the tape, the front reel, which is now the full one, must be removed from the pan, turned completely over, and transferred to the rear reel pan, making sure that the slot in the reel engages the key (31). The empty reel must be transferred to the front pan. Thread the tape, as previously described, and proceed with the recording in the same manner.

To Rewind -

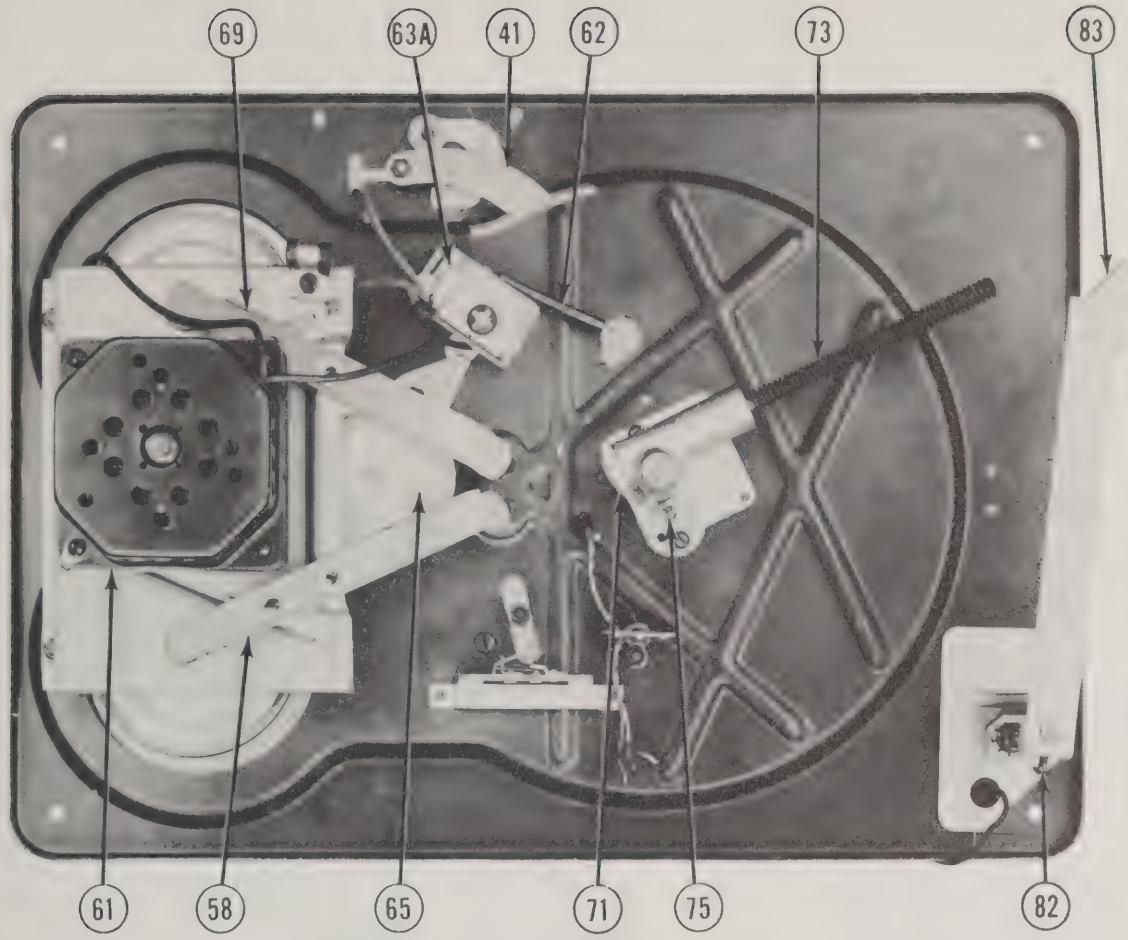
To rewind the tape to the start of the recording, shift the control knob to the position marked "Reverse." Push the control knob into the reverse slot as far as possible. The recorder is now rewinding.

To Stop the Recorder -

The tape may be stopped at any point by shifting the control knob to the position marked "Off."

Playback -

Rewind the tape to the start of the recording (see paragraph on "To Rewind"); that is, if one track only has been recorded. If both tracks have been recorded and the tape is to be played from the start, it will be necessary to remove the reels and transfer them to the opposite reel pans, as described under "Recording." Move the control knob to the "Playback" position. The recorder will now operate for playback.



To Repair or Splice Tape -

In case the tape is broken accidentally, or it is desired to edit a recording, a splice may be made with Scotch tape. Do not use medicated adhesive tape as the adhesive material is not suited to this purpose. The Scotch tape should be applied to the reverse, or uncoated, side of the recording tape. The edges of the splice should be trimmed with a small pair of scissors, or a knife, to bring the width of the splice to that of the recording tape so it will pass the various contacts without interference.

Fast-Forward - .

If a recording near the end of the tape is desired, the tape may be speeded up by moving the control knob to the "Forward" position.

To Play Standard 78 RPM Records -

To play 78 RPM records, it is only necessary to position the control knob (43) in the "Phono" position. With the control knob in the "Phono" position, the function shift lever (41) depresses both the front and rear reel clutches. This eliminates the driving of the tape, and the only function the unit performs is to rotate the turntable. In playing records, the rear portion of the pickup arm (4) is depressed; a standard playback needle is inserted in the pickup cartridge (6) and is held in position with needle thumb screw.

Cutting Disc Recordings -

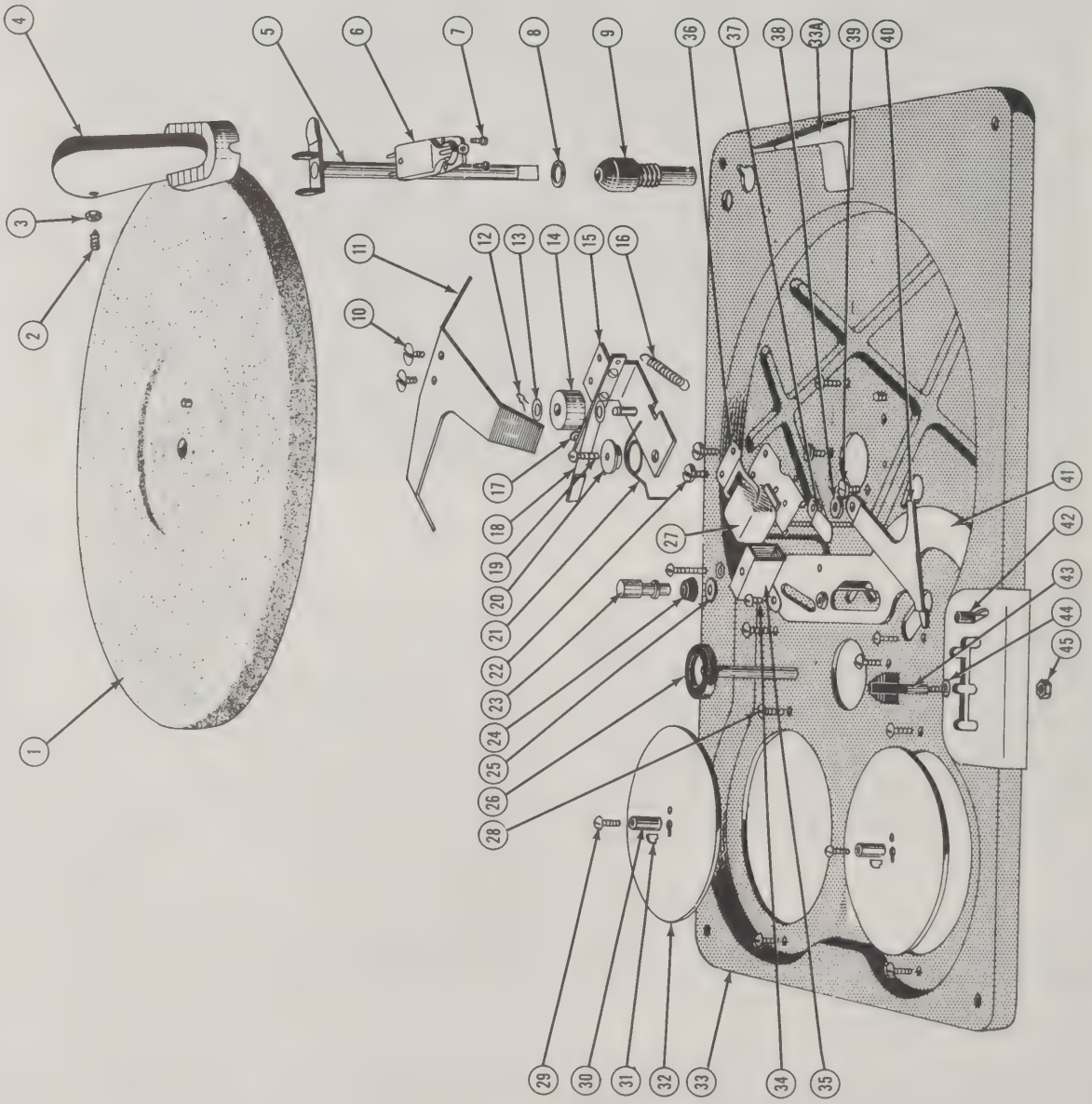
To cut home recordings, it is necessary to remove the playback needle from the cartridge (6) and insert a standard 5/8" recording stylus. Place a recording blank on the turntable with the record driving pin of the turntable through the hole provided in the recording disc. Raise the pickup arm and move it to the edge of the record. Place the recording stylus on the outer edge of the recording blank at the approximate location at which the recording is to start. Raise the rear of the pickup arm by lifting on the ear extending to the right side of the arm. The arm should be raised until the lip on the rear of the follower arm (82) engages the lock spring of the arm lock bracket assembly (80). This holds the arm in a raised position causing the follower arm (83) to engage the lead screw (73). If the recording is being done from some source other than the tape, move the control knob to the "Phono" position. If the recording is to be made from the tape, place the control knob in the "Playback" position.

MECHANICAL FUNCTION

The drive mechanism includes the following: A single motor (61), which drives both the turntable and reeling mechanism through the media of drive belts (50) and (51) and the drive pulley (65). The turntable, in turn, drives the capstan (74). These belts are coupled to the drive pulley (60) which is fastened to the motor shaft.

Operation of the Control Knob (43)
"Off" Position -

When the control knob (43) is in the "Off" position, the shift lever (41), which is fastened to the control knob, is moved against the pin of the switch assembly (63), shutting off the motor power.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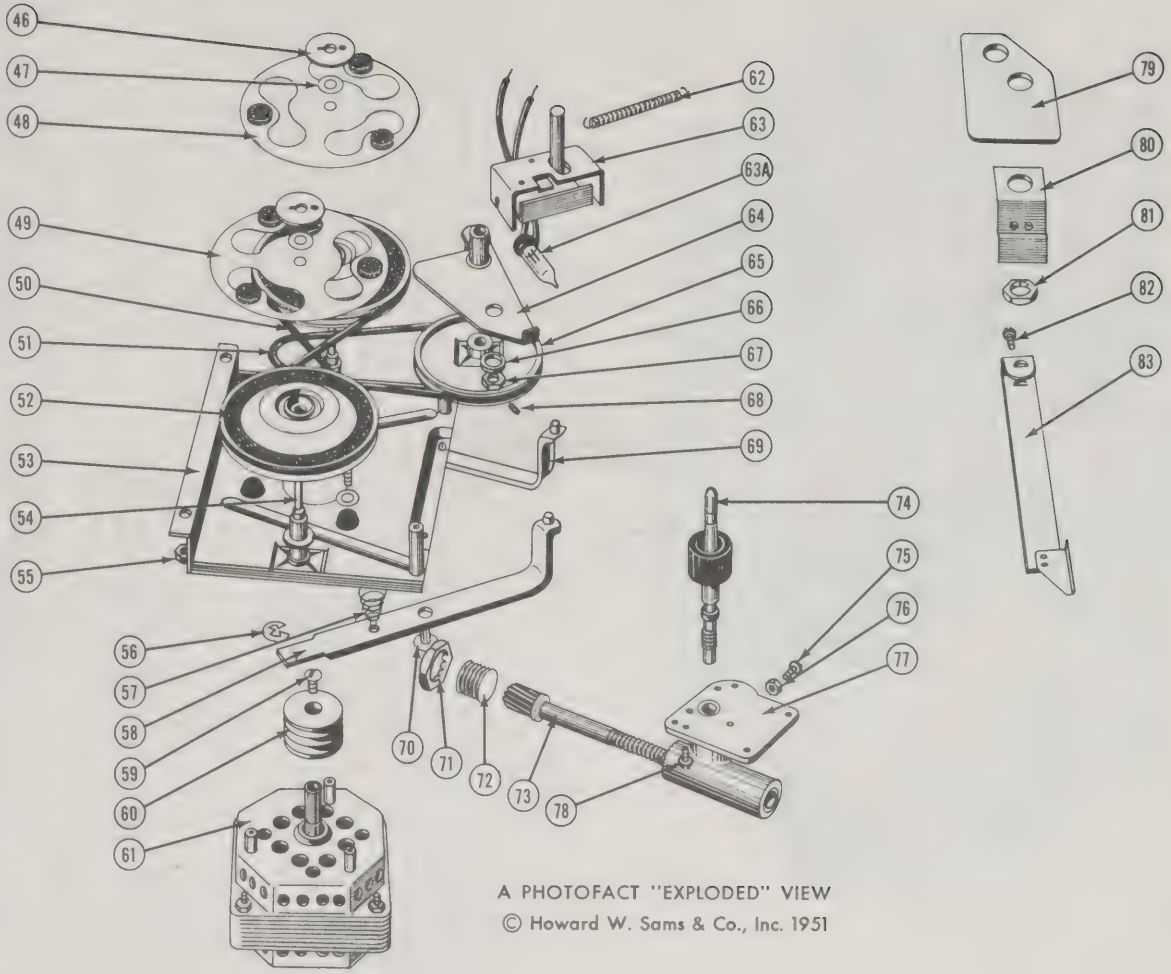

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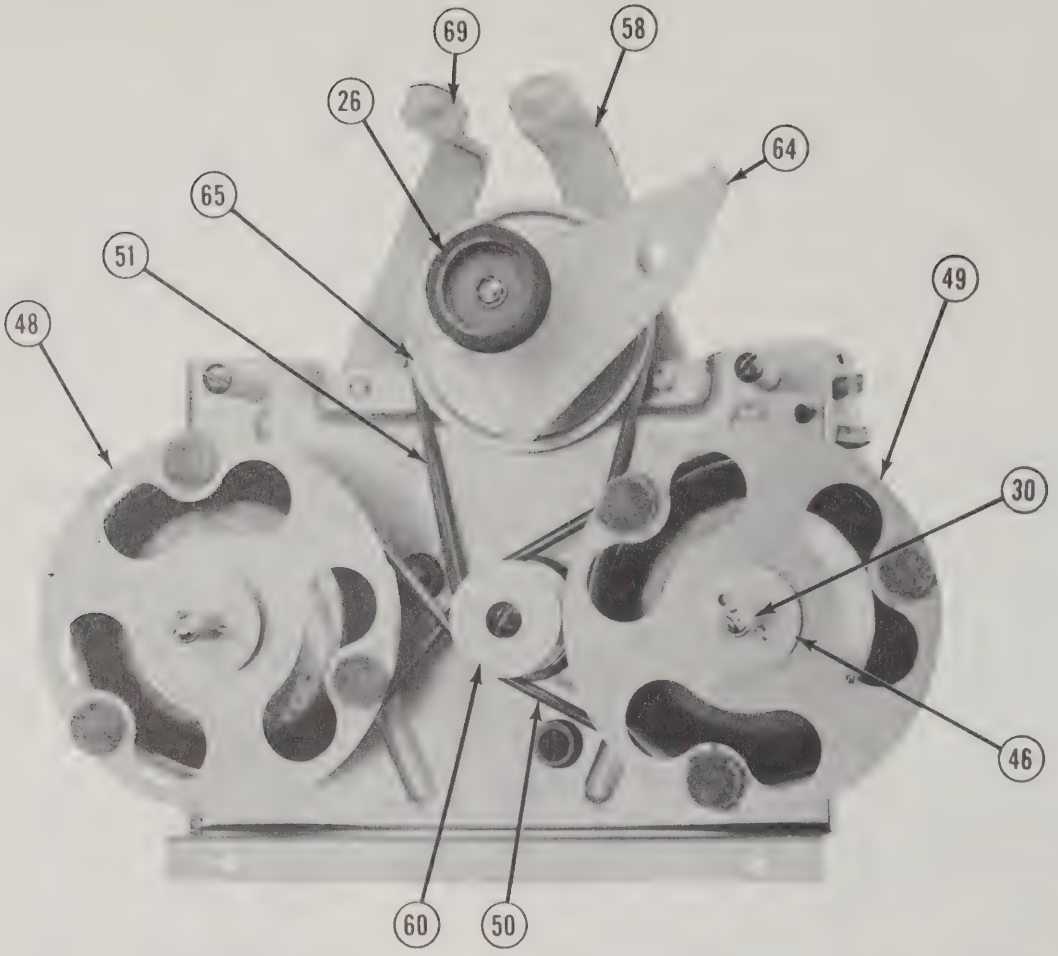


"Phono" Position -

With the control knob in the "Phono" position, the shift lever (41) is moved away from the switch pin (63). The switch actuator lever (40) then moves against the switch pin, tilting the mercury switch (63A) which turns on the motor power. The switch actuating lever (40) is actuated by spring (62). The switch actuating lever (40) is pushed away from the switch pin (40) by the shift lever (41) when in the "Off-Record and Playback" positions.

"Reverse and Forward" Positions -

When the shift lever (41) is moved to the "Reverse" position, it depresses the lift lever (58) disengaging the front reel from the clutch assembly. The rear pan engages the clutch spring, thus operating the mechanism for Fast Rewind.

For Fast Forward, the position of the reel pans are reversed. The Forward speed is approximately 20 to 1 over the 3-3/4" per second normal recording or playback tape speed.

The Fast Forward and Rewind are accomplished due to the fact that when the shift lever (41) is in these positions - "Forward - Reverse," the pinch roller (14), pressure pad and spring (18) do not contact the tape which gives free movement to reels.

"Record and Playback" -

When the control knob (43) is in either "Record" or "Playback" position, the shift lever (41) contacts the pressure pad and pinch roller assembly actuating spring (21) (see Figure 2). This brings the pinch roller (14) in firm contact with the tape and the driving capstan (74). The pressure pad (18), which is also part of this assembly, is brought into contact with the recording tape and is held firmly against the recording head (27). This assures firm contact between the driving capstan and the tape, as well as holding the recording tape firmly against the recording gap, which is part of the recording head. The driving capstan (74) is, in turn, driven by the large turntable, which acts as a flywheel, thus minimizing any flutter or "wow" effect as a result of changing velocity of the tape.

Automatic Shut Off -

When the mechansim is in the "Record" or "Playback" position, the shift lever (41) and switch actuating lever (40) are moved clear of the switch (63). The tension of the tape then holds the switch in the "On" position; however, when all the tape is wound on the forward reel, the mercury switch is permitted to tip in such a manner as to open the motor circuit, thus automatically stopping the unit.

TROUBLES AND ADJUSTMENTS

Mechanism Does Not Turn On in "Phono-Reverse" or "Forward" Position -

1. Switch actuating spring (62) loose or broken.

(a) Switch actuating spring must be connected to the switch actuating lever (40) so that the actuating lever (40) may tilt the mercury switch to the "On" position. Replace the spring (62).

Turntable Rotates in "Off Position but will not Rotate in any other Position -

1. Mercury switch (63A) turned in wrong direction. Remove mercury switch (63A) from clip of switch bracket and reverse its position (see Figure 3).

Reel Pans (32) Fail to Rotate to Wind the Tape -

1. Lift levers (58) and (69) out of adjustment.

(a) In the "Forward-Speed" position, the rear pan must be raised to the position so that it clears the clutch spring (48). At the same time, the front pan must be lowered to contact the clutch spring (49), and the lift lever (58) must clear the lower end of the front reel pan shaft by approximately 1/32" to 1/16". To adjust the lift lever (58), bend the short unflanged section of the lever immediately under the front reel pan shaft until a space of 1/32" to 1/16" clearance is obtained.

(b) In reverse, the rear reel pan is lowered and the front pan is raised. Adjust the lift lever (69) in the same manner as described above, leaving a clearance of 1/32" to 1/16."

NOTE: In the "Record" and "Playback" positions, the lift levers (58) and (69) must clear both reel pan shafts so that both the pans will contact the clutch springs (48) and (49).

Fails to Record or Playback Properly -

1. Pressure pad spring (18) loose.

(a) Check the screws that hold the pressure pad spring (18) to the mounting plate (15) to see if they are tight.

2. Pressure pad worn or missing.

(a) If the pressure pad is worn some or is out of adjustment, it may be corrected as follows:
Remove the pinch roller cover (11).
Loosen the lock nut on the adjusting screw (17).
Set the shift lever (41) in the "Record" position.
Turn the adjusting screw (17) in against the pressure pad spring (18) until the pressure pad just contacts the recording head (27). Then turn the screw 1/2 to 3/4 turn clockwise and tighten the lock nut.
Replace the pinch roller cover (11).

(b) If the pressure pad is missing, replace the pad and adjust as above.

3. Spring (21) loose or broken.

(a) If the pressure pad actuating spring (21) is broken or the mounting screw (19) is loose, allowing the spring to slip over the boss on the mounting plate (15), the pinch roller mounting plate will not be pivoted inward when in "Record" or "Playback" position. If this is turn, the tape will not be held against the capstan and recording head.

"Wow" During Disc Recording Operation -

1. Follower arm (83) not engaging lead screw (73) properly. When lifting the rear section of the pickup arm assembly, the follower arm (83) should engage the lead screw (73) before the rear of the pickup arm locks in the raised position. This engagement should be at a point between 1/8" and 1/4" before the pickup arm locks. If it is necessary to adjust this point of engagement, it can be accomplished by slightly bending the follower arm (83). If the follower arm engages the lead screw too tightly, an excessive load will be put on the lead screw, thus injecting "Wow" in the recording. If the engagement is not sufficiently heavy, there is a possibility of grouping, which is the result of the follower arm lifting up on the threads of the lead screw rather than moving along in a smooth and continuous pattern.

LUBRICATION

The recorder unit has been lubricated at time of manufacture, which should be sufficient for a long period of time; however, if the unit is used to a great extent or is subjected to extreme heat or dust, the recorder should be cleaned with carbon tetrachloride and lubricated as follows:

1. To lubricate the reel pan shaft, reel sheave (52), and reel pan clutch springs (48-49):

Remove the "C" washer (56) on the lower end of the reel shaft, and lift the reel pan (32) and clutch springs (48-49) off the machine. Place two or three drops of SAE 10 oil on the reel shaft and the inside of the bearing. Place five or six drops of SAE 20 oil in the countersunk portion of the reel sheave next to the porous bronze bearing. Saturate the felt pads on the clutch springs with SAE 60 oil.

CAUTION: Do not oversaturate the felt pad. Also avoid overlubrication of all parts, as too much oil may come in contact with the rubber drive surfaces of the drive mechanism, causing "Wow."

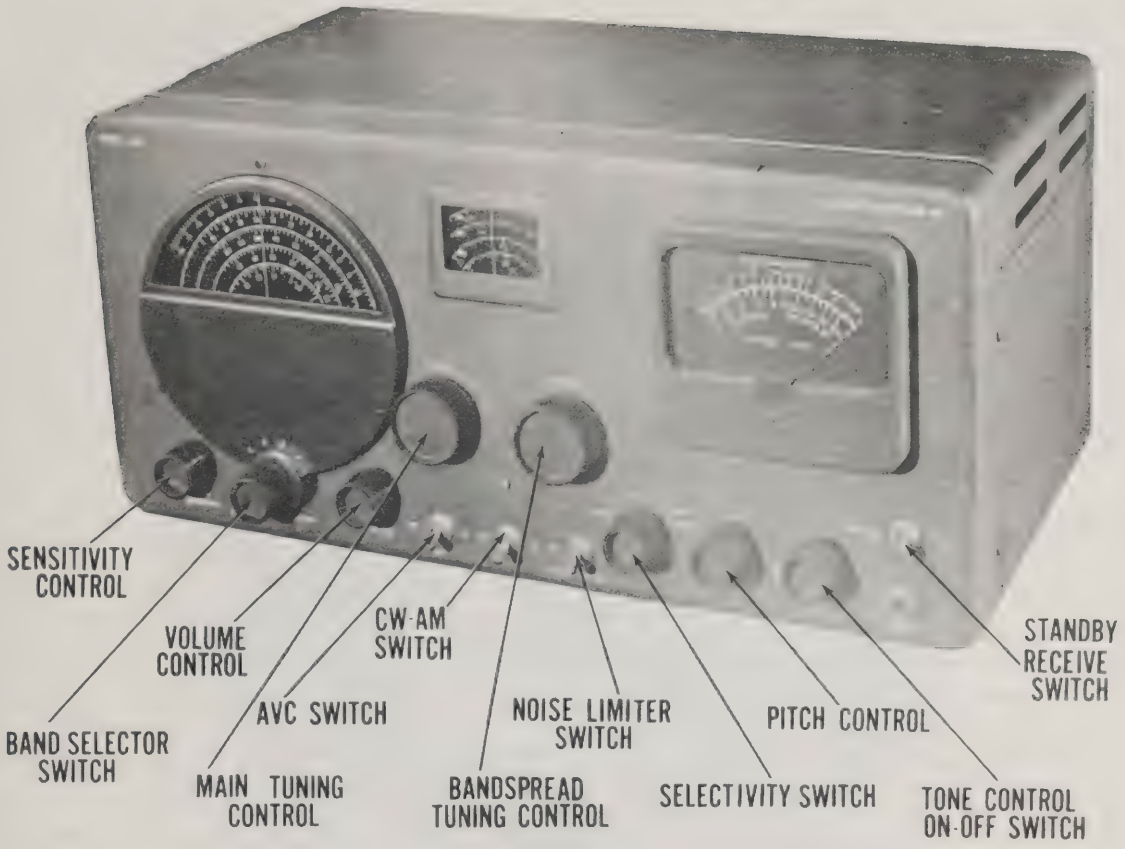
2. To lubricate the turntable drive wheel shaft (26):

Remove the turntable and place the machine on its edge. Raise the rubber drive wheel (26) in its bearing as far as it will go. Place one or two drops of SAE 10 oil on the wheel shaft.

3. Pivot post (5) and bushing (9). Raise the pickup arm to its highest position and put two or three drops of SAE 20 oil on the post. Move the post up and down several times to equalize the oil on the post.

Ref. No.	Part No.	Description
1	64419	Turntable
2	11509	Set Screw
3	16207	Lock Nut
4	25149	Tone Arm Complete
5	25108	Pivot Shaft Assembly
6	25113	Pickup Cartridge - Shure P89R
7	12098	Cartridge Mounting Screw
8	25168	Felt Washer
9	25126	Tone Arm Pivot Post Bushing
10	22903	Pinch Roller Cover Plate ing Mounting Screws
11	25193	Pinch Roller Cover Plate
12	21914	Hairpin Clip
13	21844	Fiber Washer
14	25186	Pinch Roller Hub and Tire
15	25191	Pinch Roller Mounting Plate and Stud Assembly
16	30214	Spring for Pinch Roller Mounting Plate
17	11578	Felt Pad Adjustment Screw
18	25182	Felt Pressure Pad and Spring Assembly
19	12129	Screw
20	25177	Shoulder Washer
21	25178	Pressure Pad Actuating Spring
22	11598	Screw, used for Mounting Recording Head
23	25132	Tape Guide Post
24	25131	Rubber Bushing used on Tape Guide Post
25	25157	Washer for Tape Guide Post
26	25049	Turntable Drive Wheel
27	25116	Recording Head
28	22376	Screw, used to Mount Motor Sub-Chassis
29	5871	Screw, used to Mount Disc Plate
30	25034	Sleeve Bushing for Reel Platform Assembly
31	25036	Key Lug used on Reel Platform Assembly
32	25039	Disc Plate used on Reel Platform Assembly
33	25003	Base Plate
33A	25147	Tone Arm Rest
34	25167	Screw, used for Mounting Erase Head
35	25072	Erase Head
36	25118	Spring Clip used with Recording Head
37	25121	Spring Clip
38	25119	Shoulder Washer
39	22903	Screw, used for Mounting Auxiliary Shaft Housing
40	25122	Switch Actuator Lever
41	25134	Function Switch Lever
42	25151	Safety Button
43	25146	Control Knob
44	3119	Lockwasher, used on Control Knob
45	14463	Hex Nut
46		Keyed Washer
47		Washer
48	25176	Clutch Plate Rear Assembly
49	25174	Clutch Plate Front Assembly
50	25029	Reel Drive Belt
51	25031	Turntable Drive Belt
52	25019	Reel Pan and Clutch Drive Sheave
53	25013	Sub-Chassis
54	25037	Reel Shaft
55	22861	Nut, used to Mount Sub-Chassis
56	25127	"C" Washer
57	25091	Spring, used with Lift Lever
58	25084	Lift Lever
59	22903	Screw, used to Mount Drive Pulley
60	25028	Drive Pulley
61	23235	Motor
62	25124	Spring, Switch Actuating
63	25067	Shut-off Switch Assembly (less Mercury Switch)
63A	25129	Mercury Switch
64	25054	Drive Wheel Plate and Bearing Assembly
65	25044	Drive Pulley
66	25119	Shoulder Washer
67	22861	Hex Nut
68	25056	Set Screw
69	25084	Lift Lever
70	25088	Tri-Mount Stud, Lift Lever Mounting
71	13823	Lock Nut for Lead Screw
72	21934	End Thrust Screw for Lead Screw
73	21933	Lead Screw and Gear Assembly
74	25077	Turntable Shaft and Capstan
75	7534	Lock Screw for Turntable Shaft and Capstan
76	9569	Lock Nut
77	25079	Auxiliary Shaft Housing
78	22903	Adjusting Screw, Shaft Housing
79	25166	Reinforcing Plate
80	25102	Arm Lock Bracket Assembly
81	25153	Lock Nut, Arm Bracket Assembly
82	22376	Lock Screw, Follower Arm
83	25098	Follower Arm

HALLICRAFTERS
MODELS S-76, S-76U



HALLICRAFTERS
MODELS S-76, S-76U

TRADE NAME	Hallicrafters, Models S-76, S-76U
MANUFACTURER	The Hallicrafters Co., 5th. and Kostner Avenues, Chicago, Illinois
TYPE SET	AC Operated Multi-Band Superheterodyne Communications Type Receiver
TUBES (ELEVEN)	Types 6CB6 RF Amp., 6AU6 1650KC Mixer, 6C4 Oscillator, 6BA6 1650KC IF Amp., 6BE6 50KC Converter, 6BA6 50KC IF Amp., 6AL5 DET-AVC-Noise Limiter, 6SC7 AF Amp.-BF0, 6K6GT Power Output, VR-150/0D3 Voltage Regulator, 5Y3GT Rectifier
POWER SUPPLY	105-125 Volts AC (Model S-76), 105 or 250 Volts AC (Model S-76U)
RATING	.71 Amp. at 117 Volts AC
TUNING RANGE	Band 1 538-1580KC, Band 2 1720KC-4.9MC, Band 3 4.6-13MC, Band 4 12-34MC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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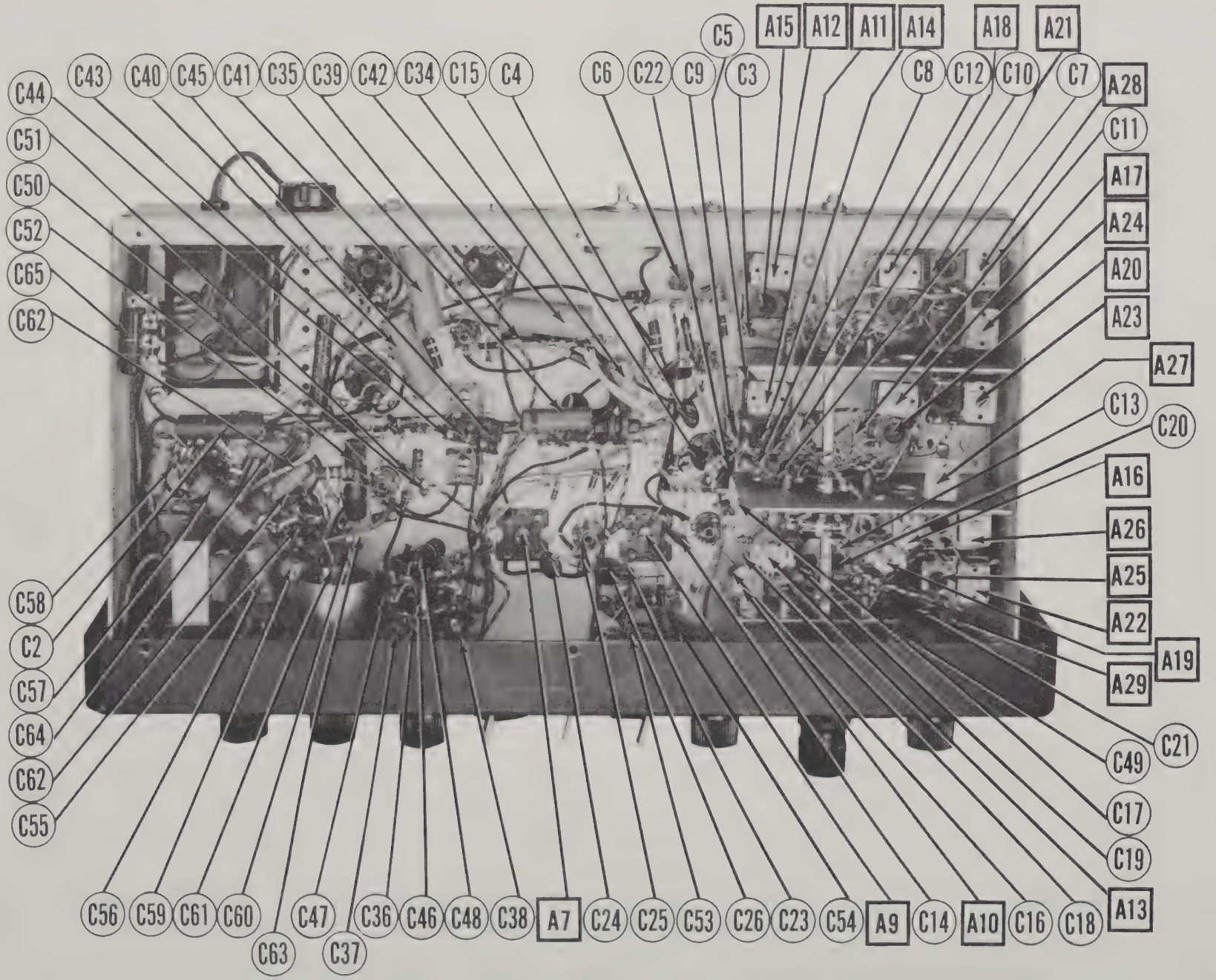
C5
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A12
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C4
C6
C22
C9
C3
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A28
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R35
R34
R41
M10
M8
R26
M7
R22
R52
R21
R23
R2
R19
R32
R18

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	90X6CB6	6CB6	6CK	
V2	1650KC Mixer	90X6AU6	6AU6	7BK	
V3	Oscillator	90X6C4	6C4	6BG	
V4	1650KC IF Amp.	90X6BA6	6BA6	7BK	
V5	50KC Converter	90X6BE6	6BE6	7CH	
V6	50KC IF Amplifier	90X6BA6	6BA6	7BK	
V7	Detector-AVC-Noise Limiter	90X6AL5	6AL5	6BT	
V8	AF Amplifier-BFO	90X6SC7	6SC7	8S	
V9	Power Output	90X6K6GT	6K6GT	7S	
V10	Voltage Regulator	VR150/0D3	VR150/0D3	4AJ	
V11	Rectifier	90X5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	450	45B113			UPT62245		TVL-3790	▲ Filter
B	20	450						TVA-1705	■ Filter
C	20	450							▲ Filter
C2	10	25	45A121	PRS25/10		BR102A		TVA-1204	Output Cathode
C3	220		47B20221K5	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	RF Coupling
C4	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Amp. Screen
C5	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Amp. Cathode
C6	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AVC Filter
C7	2.2		47A160-4		TCZ-2.2		NP0K-2R2		Fixed Trimmer
C8	220		47B20221K5	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	RF Bypass
C9	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	RF Bypass
C10	25		47X20UK250K				N750K-250	5TCU-Q25	RF Coupling
C11	2.2		47A160-4		TCZ-2.2		NP0K-2R2		RF Coupling
C12	100		47X20UJ101K	SI100N750	TCN-100		N750L-101	5TCU-T1	RF Coupling
C13	2.2		47A160-4		TCZ-2.2		NP0K-2R2		Osc. Coupling
C14	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1650KC Mixer Plate
C15	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1650 KC Mixer Screen
C16	100		47X20UJ101K	SI100N750	TCN-100		N750L-101	5TCU-T1	Osc. Feedback
C17	100		47X20UJ101K	SI100N750	TCN-100		N750L-101	5TCU-T1	Osc. Grid Cap.
C18	25		47X20UK250K				N750K-250	5TCU-Q25	Fixed Trimmer
C19	2400	500	47X30D242J	1464-0025		1R5D25			Fixed Padder
C20	1000	500	47X25D102J	1464-001		1R5D1		MS-21	Fixed Padder
C21	470	500	47X20B471K	1469-0005	TCN-470	5R5T5	N750L-471	MS-35	Fixed Padder
C22	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1650KC Mixer Cathode
C23	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	AVC Filter
C24	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1650KC IF Amp. Dec.
C25	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1650 Kc IF Amp. Screen
C26	5000		47A168	BPD-005	DD-502	1D5D5	811-005	5HK-D5	1650 Kc IF Amp. Cathode
C27	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	Osc. Anode Dec.
C28	100		47X20UJ101K	SI100N750	TCN-100		N750L-101	5TCU-T1	Osc. Grid Cap.
C29	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	Conv. Cathode
C30	100		47X20UJ101K	SI100N750	TCN-100		N750L-101	5TCU-T1	Fixed Trimmer
C31	2.2		47A160-4		TCZ-2.2		NP0K-2R2		IF Coupling
C32	390	500	47X20D391J	1469-0004	TCN-390	5R5T4	N750L-391	MS-34	Fixed Trimmer
C33	390	500	47X20D391J	1469-0004	TCN-390	5R5T4	N750L-391	MS-34	Fixed Trimmer
C34	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	50KC Conv. Dec.
C35	.02	600	46A4203J	P688-02	DF-203	PTE6S2		6TM-S2	RF Bypass
C36	.0047	600	46A181	P688-0047	D6-472		GP2-333-472	6TM-D47	Fixed Padder
C37	.01	600	46A179	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Padder
C38	.022	600	46A180	P688-022				6TM-S22	Fixed Padder
C39	470	500	47X20B471K	1469-0005	TCN-470	5R5T5	N750L-471	MS-35	IF Coupling
C40	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	50KC IF Amp. Dec.
C41	.05	600	46AY503J	P688-05	DF-503	PTE6S5		6TM-S5	50KC IF Amp. Screen
C42	.25	200	46AT254J	P488-25		GT2P25		2TM-P25	50KC IF Amp. Cathode
C43	2.2		47A160-4		TCZ-2.2		NP0K-2R2		IF Coupling
C44	390	500	47K20D391J	1469-0004	TCN-390	5R5T4	N750L-391	MS-34	Fixed Trimmer
C45	390	500	47X20D391J	1469-0004	TCN-390	5R5T4	N750L-391	MS-34	Fixed Trimmer
C46	.0047	600	46A181	P688-0047	D6-472		GP2-333-472	6TM-D47	Fixed Padder
C47	.01	600	46A179	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Fixed Padder

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Hallicrafters PART No.	IRC PART No.	IDENTIFICATION CODES
R28	15Ω	½	23X20X150K		Parasitic Supppessor
R29	22KΩ	½	23X20X223K	BTS-22K	50KC Osc. Grid
R30	10KΩ	1	23X30X103K	BTA-10K	50KC Osc. Anode
R31	150Ω	½	23X20X151K	BTS-150	50KC Conv. Cathode
R32	3300Ω	½	23X20X332K	BTS-3300	50KC Conv. Plate Decoupling
R33	470Ω	½	23X20X471K	BTS-470	Bias Network
R34	180Ω	½	23X20X181K		Parasitic Suppressor
R35	220Ω	½	23X20X221K		Parasitic Suppressor
R36	390Ω	½	23X20X391K		Parasitic Suppressor
R37	1Meg	½	23X20X105K	BTS-1Meg	50KC IF Amp. Grid
R38	100Ω	½	23X20X101K	BTS-100	50KC IF Amp. Cathode
R39	39KΩ	1	23X30X393K	BTA-39K	50KC IF Amp. Screen
R40	3300Ω	½	23X20X332K	BTS-3300	50KC IF Amp. Decoupling
R41	180Ω	½	23X20X181K		Parasitic Suppressor
R42	220Ω	½	23X20X221K		Parasitic Suppressor
R43	390Ω	½	23X20X391K		Parasitic Suppressor
R44	6.8Ω	1	23X30X068K		Diode Filament
R45	1.5Meg	½	23X20X155K	BTS-1.5Meg	Noise Limiter Diode Load
R46	1Meg	½	23X20X105K	BTS-1Meg	Voltage Divider
R47	1Meg	½	23X20X105K	BTS-1Meg	Voltage Divider
R48	82KΩ	½	23X20X823K	BTS-82K	Det. Diode Load
R49	330KΩ	½	23X20X334K	BTS-330K	Det. Diode Load
R50	47KΩ	½	23X20X473K	BTS-47K	AVC Network
R51	3.3Meg	½	23X20X335K	BTS-3.3Meg	AVC Network
R52	100Ω	½	23X20X101K	BTS-100	AVC Network
R53	470KΩ	½	23X20X474K	BTS-470K	Phono Input Shunt
R54	120KΩ	½	23X20X124K	BTS-120K	BFO Grid-See Note 2
R55	39KΩ	½	23X20X393K	BTS-39K	BFO Plate-See Note 3
R56	15Meg	½	23X20X156K	BTS-15Meg	AF Amp. Grid
R57	220KΩ	½	23X20X224K	BTS-220K	AF Amp. Plate
R58	470KΩ	½	23X20X474K	BTS-470K	Output Grid
R59	390Ω	1	23X30X391K	BTA-390	Output Cathode
R60	560Ω	1	23X30X561K	BTA-560	Output XFMR Shunt
R61	390KΩ	½	23X20X394K	BTS-390K	Bias Network-See Note 4
R62	3000Ω	10	24BG302F	1 3/4A-3000	Voltage Regulator Load
R63	10KΩ	½	23X20X103K	BTS-10K	Filter

Note 1 Some models use 2.2Meg resistor in this application.
Note 2 Some models use 100KΩ resistor in this application.
Note 3 Some models use 47KΩ resistor in this application.
Note 4 Some models use 350KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC @ .71A	540VCT .105ADC	5VAC @ 2A	6.3VAC @ 3.5A	52C221 ① 52C222		P-3052 ④	PH-120 ③

① Used in model S-76U.
② Add series resistor to reduce plate voltage.
④ Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Hallicrafters PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T2	7KΩ	500Ω Tap 3.2Ω	370Ω	52Ω Tap .4Ω	55B120	A-3878	A2900	RO-13	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C48	.022	600	46A180	P688-022				6TM-S22	Fixed Padder
C49	.25	200	46AT254J	P488-25		GT2P25		2TM-P25	RF Bypass
C50	220		47B20221K5	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	Diode RF Filter
C51	220		47B20221K5	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	Diode RF Filter
C52	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C53	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C54	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C55	220		47B20221K5	SI220	D6-221	5R5T25	GP2K-221	5GA-T22	RF Bypass
C56	.005	600	46AY502J	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Tone Comp.
C57	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C58	.01	600	46X35X103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Output Plate
C59	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	BFO Feedback
C60	470	500	47X20B471K	1469-0005		5R5T5		MS-35	BFO Grid Cap.
C61	560	500	47X20D561J						Fixed Trimmer
C62	.02	600	46AY203J	P688-02	DF-203	PTE6S2		6TM-S2	RF Bypass
C63	47		47X20UK470K	SI47	D6-470	5R5Q5	GPIK-470	5GA-Q47	BFO Coupling
C64	.05	200	46AU503J	P288-05	DF-503	PTE4S5		2TM-S5	Noise Limiter Filter
C65	.01	600	46X35X103J	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Line Filter

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	10KΩ	½	25B590	Q13-116	AM-81-Z	B-15	Sensitivity Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A Per Instructions.
R2A	500KΩ	½	25B534	Q13-133	AM-60-Z	B-60	Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R2A Per Instructions.
R3A	500KΩ	½	25B605	Q13-133	AG-60-Z	B-60-S	Tone Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R3A Per Instructions.
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R3A Per Instructions.
R4	500Ω	4			RTV-25		"S" Meter Adjustment-Wire Wound

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Hallicrafters PART No.	IRC PART No.	IDENTIFICATION CODES
R5	22Ω		23X20X220K		Parasitic Suppressor
R6	15Ω		23X20X150K		Parasitic Suppressor
R7	1Meg		23X20X105K	BTS-1Meg	RF Amp. Grid
R8	180Ω		23X20X181K	BTS-180	RF Amp. Cathode
R9	39KΩ	1	23X30X393K	BTA-39K	RF Amp. Screen
R10	1000Ω		23X20X102K	BTS-1000	RF Choke Shunt
R11	3300Ω		23X20X332K	BTS-3300	RF Amp. Plate
R12	3300Ω		23X20X332K	BTS-3300	RF Amp. Plate
R13	6800Ω	1	23X30X682K	BTA-6800	RF Amp. Plate
R14	3300Ω		23X20X332K	BTS-3300	RF Amp. Plate Decoupling
R15	15Ω		23X20X150K		Parasitic Suppressor
R16	1.5Meg		23X20X155K	BTS-1.5Meg	1650KC Mixer Grid-See Note 1
R17	2200Ω		23X20X222K	BTS-2200	1650 KC Mixer Cathode
R18	330KΩ		23X20X334K	BTS-330K	1650 KC Mixer Screen
R19	3300Ω		23X20X332K	BTS-3300	1650 KC Mixer Plate Decoupling
R20	22KΩ		23X20X223K	BTS-22K	Osc. Grid
R21	10KΩ	1	23X30X103K	BTA-10K	Osc. Plate
R22	15Ω		23X20X150K		Parasitic Suppressor
R23	120KΩ		23X20X124K	BTS-120K	AVC Network-See Note 2
R24	100Ω		23X20X101K	BTS-100	1650KC IF Amp. Cathode
R25	8200Ω		23X20X822K	BTS-8200	1650 KC IF Amp. Screen
R26	3300Ω		23X20X332K	BTS-3300	1650 KC IF Amp. Plate Decoupling
R27	270Ω		23X20X271K	BTS-270	"S" Meter Shunt

SET 143
FOLDER 9

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	INSTALLATION NOTES
L1	.105A	330Ω	9 Henries	56B107		C-2995 ②	R-23110 ②	② One new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA MEISSNER PART No.	NOTES
L2	Ant. Coil	.2Ω	0Ω	51B1325		Band 4
L3	Ant. Coil	.3Ω	.1Ω	51B1324		Band 3
L4	Ant. Coil	.4Ω	1.5Ω	51B1323		Band 2
L5	Ant. Coil	28Ω	5.8Ω	51B1322		Band 1
L6	RF Choke	.3Ω		53A215		
L7	RF Coil	1.3Ω	0Ω	51B1327		Band 4
L8	RF Coil	9Ω	.1Ω	51B1326		Band 3
L9A	RF Coil	1.5Ω		51B1319		Band 2 L9A and 9B wound on same
L9B	RF Coil	6.5Ω				Band 1 Form
L10	Osc. Coil	2Ω	.1Ω	51B1321		Band 4
L11	Osc. Coil	.5Ω	.1Ω	51B1320		Band 3
L12	Osc. Coil	.5Ω	.9Ω	51B1329		Band 2
L13	Osc. Coil	.7Ω	2Ω	51B1328		Band 1
L14	1st IF	.8Ω	.8Ω	50B488		1650KC
L15	2nd IF	.8Ω	.8Ω	50B488		1650KC
L16	Osc. Coil	.4Ω		50B490		1600KC (Tap 2Ω)
L17	1st IF Pri.	32Ω		50B489		50KC (Tap 14Ω)
L18	1st IF Sec.	32Ω		50B489		50KC (Tap 14Ω)
L19	2nd IF Pri.	32Ω		50B489		50KC (Tap 14Ω)
L20	2nd IF Sec.	32Ω		50B489		50KC (Tap 14Ω)
L21	BFO Osc. Coil	100Ω		54B045		(Tap 69Ω)
L22	RF Choke	9Ω		53A107		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA Hallicrafters PART No.	REPLACEMENT DATA	NOTES
M1	Bayonet	6-8	.25	Blue	39A003		Type number 44.
M2	Bayonet	6-8	.25	Blue	39A003		Type number 44.
M3	Bayonet	7.5	.2	White			Type number 51.
M4	Bayonet	7.5	.2	White			Type number 51.

MISCELLANEOUS

ITEM No.	PART NAME	HALLICRAFTERS PART No.	NOTES
M5A	Switch	62B053	Band, Ant. Section
B	Switch	62B053	Band, RF Section
C	Switch	62B054	Band, Osc. Grid Section
D	Switch	62B055	Band, Osc. Plate Section
M6	Switch	60B399	Selectivity
M7	Switch	60A138	AVC
M8	Switch	60A138	AM-CW
M9	Switch	60A192	Receiver-Standby
M10	Switch	60A138	Limiter
M11	Meter	82C183	Carrier Level
M12	3 Gang Var. Cap.	48C244	(12-420MMF) Each Section
M13	3 Gang Var. Cap.	48C243	Bandspread
	Cabinet	66D652	
	Dial Scale	83B387	Main
	Dial Scale	83B388	Bandspread

VOLTAGE READINGS

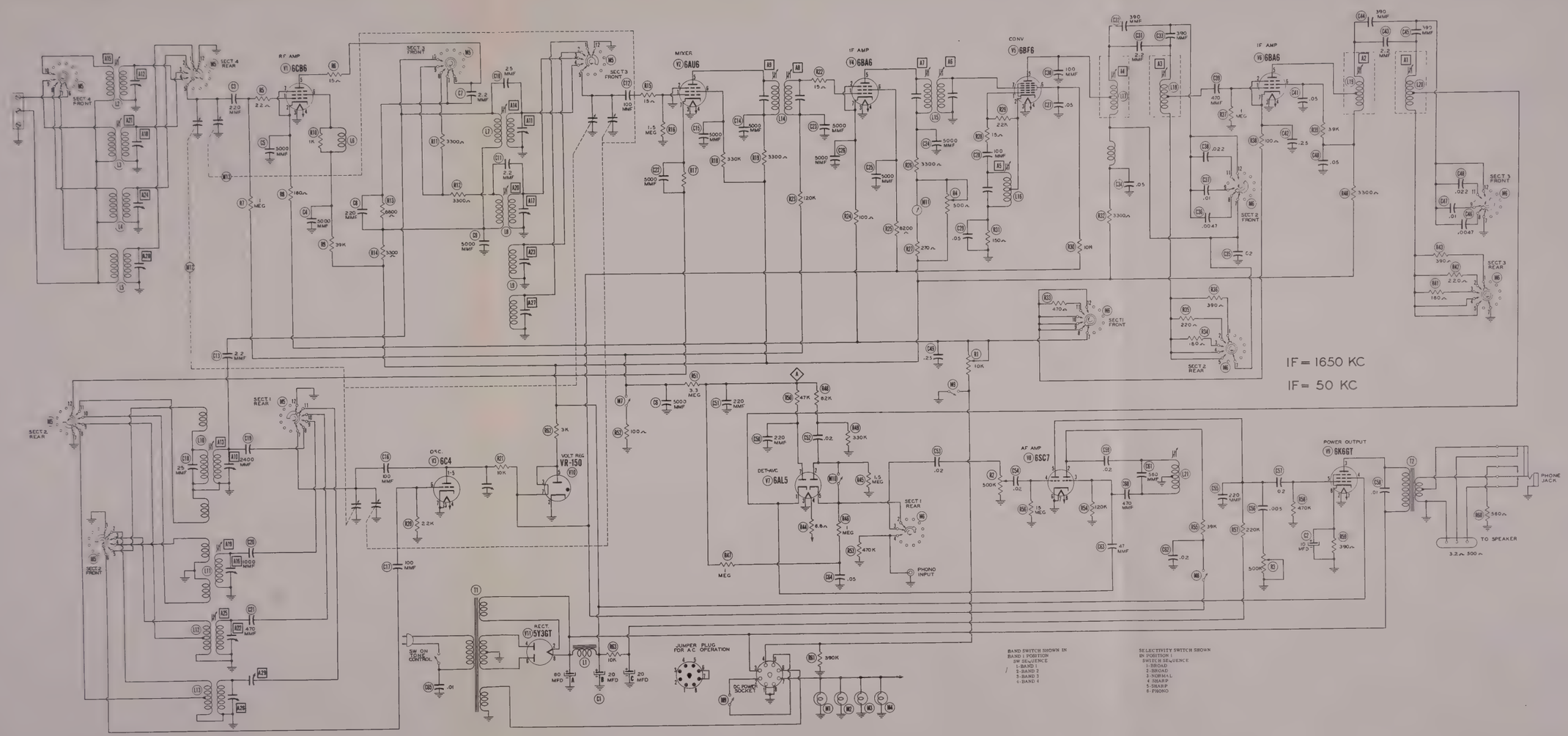
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6CB6	0V	26VDC	0V	6.3VAC	260VDC	255VDC	26VDC	
V 2	6AU6	-3.8VDC	0V	0V	6.3VAC	255VDC	70VDC	4.6VDC	
V 3	6C4	85VDC	0V	0V	6.3VAC	85VDC	§-11VDC	0V	
V 4	6BA6	0V	26VDC	0V	6.3VAC	260VDC	135VDC	26VDC	
V 5	6BE6	§-1.8VDC	1.4VDC	0V	6.3VAC	260VDC	85VDC	0V	
V 6	6BA6	0V	26VDC	0V	6.3VAC	250VDC	220VDC	26VDC	
V 7	6AL5	0V	-.1VDC	0V	4.3VAC	0V	0V	-.1VDC	
V 8	6SC7	0V	▲115VDC	-.5VDC ▲-6.1VDC	-.3VDC	95VDC	0V	0V	6.3VAC
V 9	6K6GT	0V	0V	265VDC	260VDC	0V	280VDC	6.3VAC	16VDC
V 10	VR-150/0D3	0V	0V	140VDC	260VDC	140VDC	0V	140VDC	0V
V 11	5Y3GT	260VDC	280VDC	0V	280VAC	0V	280VAC	0V	280VDC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6CB6	4.7Meg	10KΩ	0Ω	.1Ω	†10KΩ	†39KΩ	10KΩ	
V 2	6AU6	1.5Meg	0Ω	0Ω	.1Ω	†3.6KΩ	†330KΩ	2.2KΩ	
V 3	6C4	†13KΩ	Inf.	0Ω	.1Ω	†13KΩ	22KΩ	0Ω	
V 4	6BA6	3.8Meg	10KΩ	0Ω	.1Ω	†3.6KΩ	†11KΩ	10KΩ	
V 5	6BE6	22KΩ	150Ω	0Ω	.1Ω	†3.6KΩ	†13KΩ	.8Ω	
V 6	6BA6	1Meg	10KΩ	0Ω	.1Ω	†3.6KΩ	†42KΩ	10KΩ	
V 7	6AL5	390Ω	1.5Meg	0Ω	2.5Ω	2.4Meg	Inf.	450KΩ	
V 8	6SC7	0Ω	†▲42KΩ	120KΩ	15Meg	†230KΩ	0Ω	0Ω	.1Ω
V 9	6K6GT	Inf.	0Ω	†370Ω	†330Ω	470KΩ	†0Ω	.1Ω	390Ω
V 10	VR-150/0D3	Inf.	0Ω	†3.3KΩ	†330Ω	†3.3KΩ	Inf.	†3.3KΩ	Inf.
V 11	5Y3GT	†330Ω	40KΩ	Inf.	70Ω	Inf.	78Ω	Inf.	40KΩ

▲ CW AND AM SWITCH IN CW POSITION.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
ALL MEASUREMENTS TAKEN IN BC BAND #1.
▲ CW AND AM SWITCH IN CW POSITION.
† MEASURED FROM PIN 8 OF V11.
SELECTIVITY SWITCH IN BROAD 1.
AVC SWITCH IN ON POSITION.
NOISE LIMITER SWITCH IN ON POSITION.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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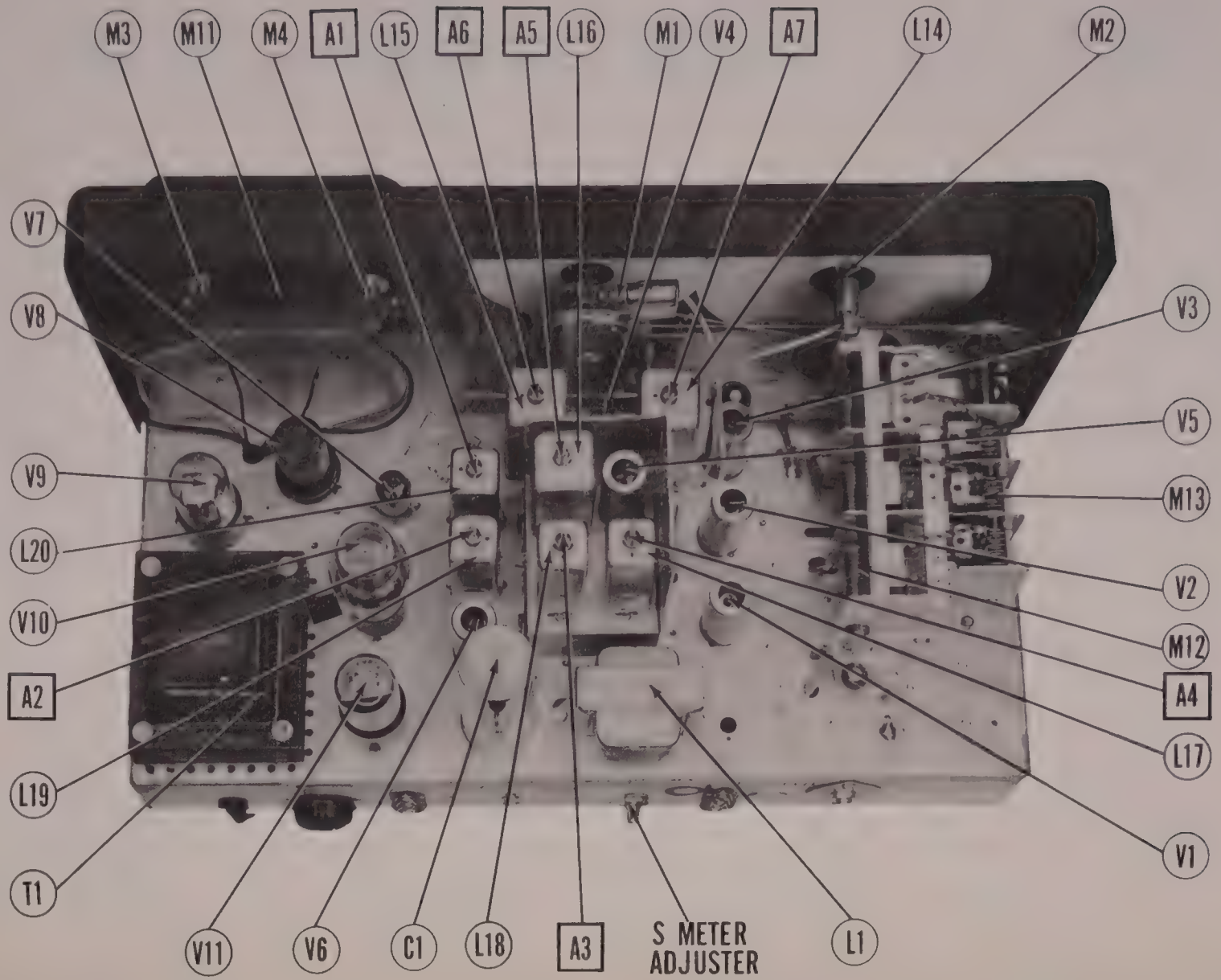
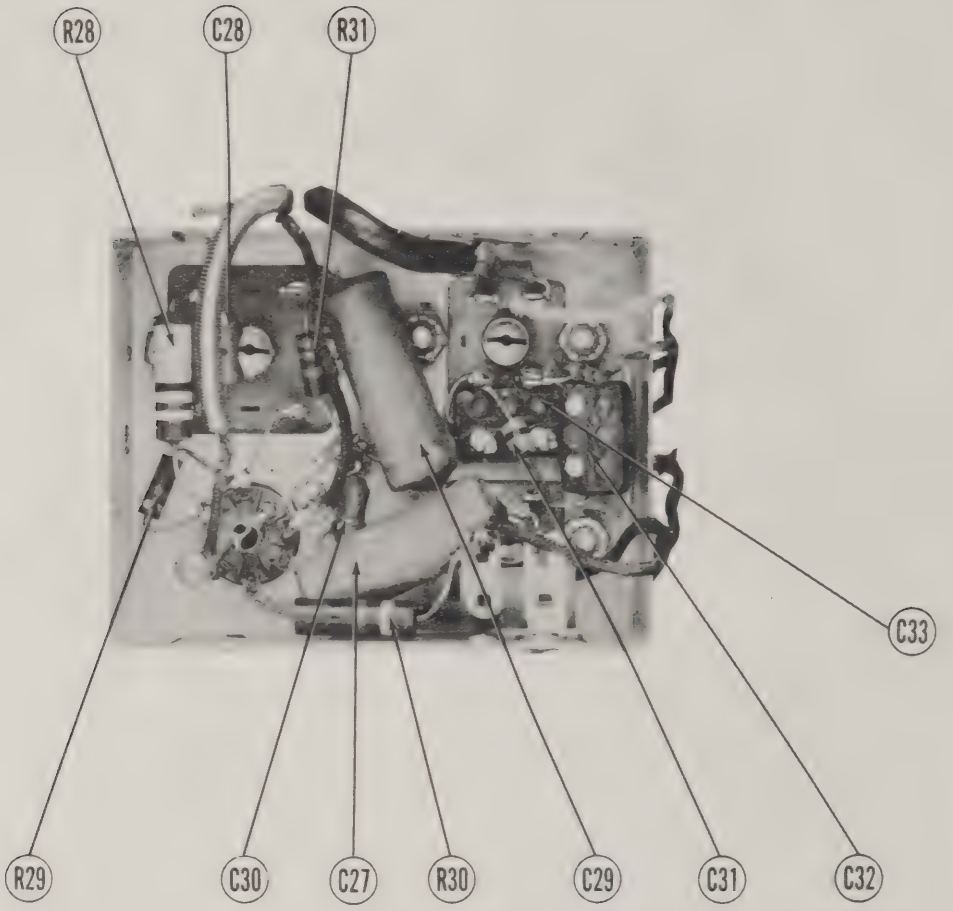
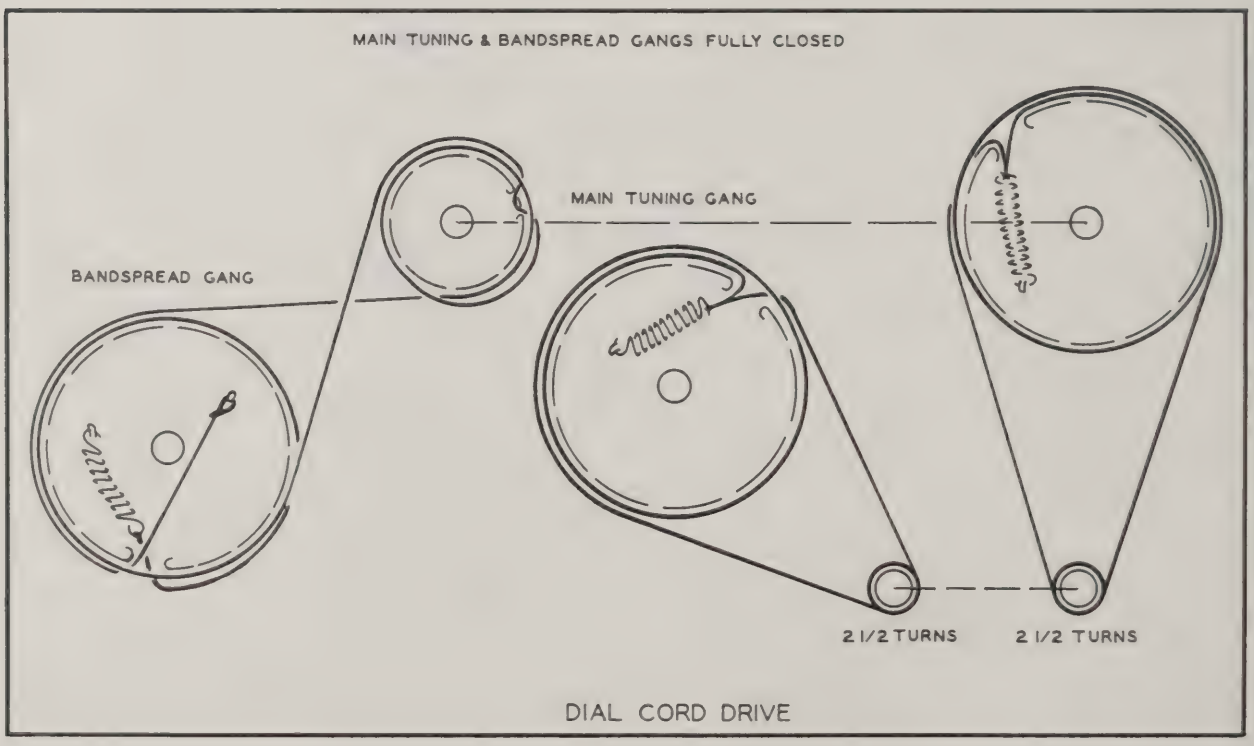
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial turn tuning gang fully closed and set the zero on the logging scale under the dial index line.
Turn the noise limiter and AVC switches to "off", send-receive switch to "receive", CW/AM switch to AM, and the band selector to "band 2".
Turn both main tuning and bandspread capacitors to half meshed.
During alignment of the 50KC IFs, (step 1), remove the first oscillator tube, (V3). from its socket to prevent signal interference
Connect a 3.2 or 500Ω speaker.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to terminal 1 on L15. Low side to chassis.	50KC (unmod.)	2	Tuning gang half meshed.	Use VTVM DC Probe to Point A . Common to chassis.	A1, A2, A3, A4	Adjust in the order given for maximum deflection. Then repeat the adjustments in the same order.
2.	"	High side to stator on center section of main tuning gang. Low side to chassis.	1650KC	"	"	"	A5, A6, A7, A8, A9	Replace V3. Adjust A5 for maximum deflection. Then retune signal gen. for maximum deflection. Adjust A6, A7, A8, and A9 for maximum deflection, at the new frequency. Rotate the selectivity switch from step 5 to step 1. The reading on the VTVM should decrease progressively, if not repeat step.1.
3.	"	High side to terminal 1 on L15. Low side to chassis.	50KC (unmod.)	"	'	Use speaker as indicator		Turn CW/AM switch to "CW". Remove pitch control knob. Turn pitch control shaft for zero beat indication on speaker. Replace knob with indicator line straight up. Turn switch back to "AM".
	Turn the BAND SPREAD, VOLUME, TONE, and SENSITIVITY controls fully clockwise. Turn the SELECTIVITY switch to 3. Leave all other controls as set.							
4.	330Ω carbon resistor	High side thru 330Ω to antenna terminal "A1", (connect link) Low side to chassis.	30MC (400∿ Mod.)	4	30MC	DC Probe to Point A . Common to chassis.	A10, A11 A12	Adjust for maximum deflection.
5.	"	"	14MC	"	14MC	"	A13, A14 A15	Adjust for maximum deflection. Repeat steps 4 and 5 until no further improvement can be made.
6.	"	"	11.5MC	3	11.5MC	"	A16, A17 A18	Adjust for maximum deflection.
7.	"	"	5.1MC	"	5.1MC	"	A19, A20 A21	Adjust for maximum deflection. Repeat steps 6 and 7 until no further improvementscan be made.
8.	"	"	4.6MC	2	4.6MC	"	A22, A23 A24	Adjust for maximum deflection.
9.	"	"	1.925MC	"	1.925MC	"	A25	Adjust for maximum deflection. Repeat steps 8 and 9 until no further improvement can be made.
10.	"	"	1400KC	1	1400KC	"	A26, A27, A28	Adjust for maximum deflection.
11.	'	"	600KC	"	600KC	" "	A29	Adjust for maximum deflection. Repeat steps 10 and 11 until no further improvement can be made.


M3
M11
M4
A1
L15
A6
A5
L16
M1
V4
A7
L14
M2
V7
V8
V3
V5
V9
M13
L20
V2
V10
M12
A2
A4
L17
L19
V1
T1
V11
V6
C1
L18
A3
S METER
ADJUSTER
L1





DIAL CORD DRIVE

KNIGHT
MODEL 5H-570

KNIGHT
MODEL 5H-570

TRADE NAME	Knight, Model 5H-570
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago, Ill.
TYPE SET	AC-DC Operated Superheterodyne Receiver with Loop Antenna
TUBES (FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 DET.-AVC-AF, 50C5 or 35B5 Power Output, 35Z5GT or 35Z4GT or 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC — RATING .250 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning cap fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A5	"

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PARTS LIST AND DESCRIPTIONS

KNIGHT
MODEL 5H-570

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: KNIGHT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Detector-AVC-AF Amplifier	12AV6	12AV6	7BT	
V4A	Power Output	50C5	50C5	7CV	
B	Power Output	35B5	35B5		
V5A	Rectifier	35Z5	35Z5	6AD	
B	Rectifier	35Z4	35Z4	5AA	
C	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: KNIGHT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	150	N-7204	PRS150/50-30		EDL42215		TVA-2450	Filter
B	20	150							Filter †
C2	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Ant. Isolation
C3	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Tuning Cap. Isolation
C4	100		N-7549	S1100N750	TCN-100		N750L-101		Fixed Trimmer *
C5	100		N-6015	S1100	D6-101	5W5T1	GP1K-101	19C11	Diode RF Filter
C6	.005	600	N-4894	P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C7A	250		♦	S1250	♦	5W5T25	GP2K-251	1FM-325	AF Amp. Plate
B	.01			P488-01	PC-71	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C8	.01	400	N-1344	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Output Plate
C9	.05	400	N-1346	P488-05	DF-503	PTE4S5		4TM-S5	Rectifier Plate
C10	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Line Isolation

† Some models use 50-30MFD @ 150V–Mfgrs. Part # N-7889 in this application.
‡ Not used in all models.
* This item required only with IF transformer Part # N-7542
♦ Items C7A, C7B, R6A, R6B, are compined in one unit in some models

CONTROLS

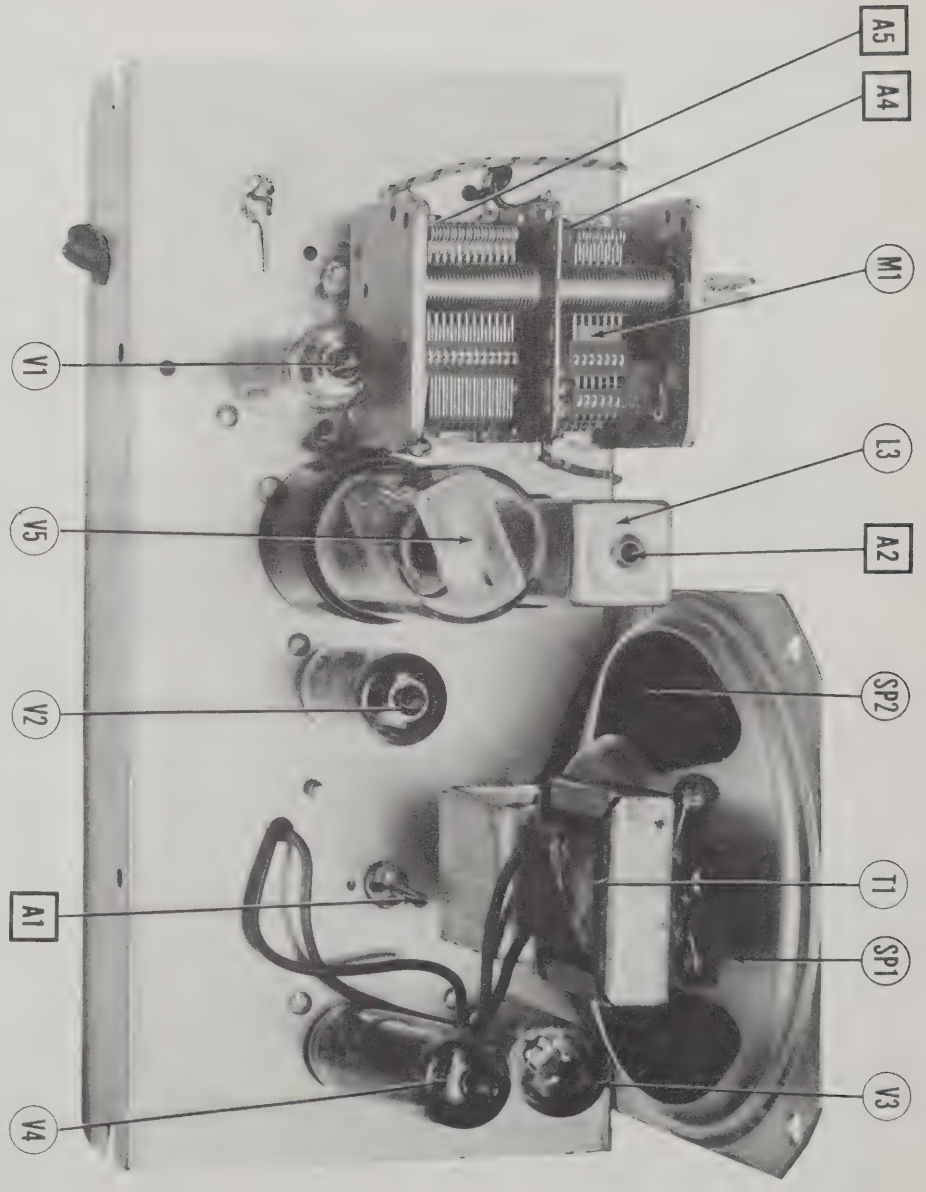
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	N-7890	Q13-133	AG-60-Z	BSK-60-S	Volume Control
B	Shaft		Not req.	Not req.	KSS-3	Not req.	Attach to R1A per instructions
C	Switch		Not req.	76-1	SWB	Not req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: KNIGHT PART No.	IRC PART No.	IDENTIFICATION CODES
R2	18KΩ	½	N-4025	BTS-18K	Osc. Grid - See Note 2
R3	1Meg.	½	N-1262	BTS-1Meg.	AVC Network
R4	68Ω	½	N-6485		IF Amp. Cathode - See Note 4
R5	5Meg.	½	N-4028	BTS-4.7Meg.	AF Amp. Grid - See Note 3
R6A	220KΩ	½	♦	BTS-220K	AF Amp. Plate
B	470KΩ	½		BTS-470K	Output Grid
R7	220Ω	½	N-4024	BTS-220	Output Cathode - See Note 4
R8	1200Ω	1	N-4900	BTA-1200	Filter
R9	33Ω	½		BW-½-33	Surge Limiter - Wire Wound - See Note 1
R10	68Ω			BW-2-68	Filament Dropping - See Note 5

♦ Items R6A, R6B, C7A, and C7B are combined into one unit.
Note 1 Not used in all models.
Note 2 Some models use 22KΩ Resistor in this application.
Note 3 Some models use 6.8Meg. Resistor in this application.
Note 4 Some models use series resistors in this application to obtain desired value.
Note 5 Used only in models with 35B5 Audio Output Tube.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		KNIGHT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.5KΩ	3.7Ω	170Ω	.7Ω	Part of Speaker	A-3330 ①	A-2928 ①	R0-2 ①	① Bend mounting tabs down file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			KNIGHT PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD	V.C. IMP.		ST-113		
SP1	PM	3.7Ω	N7824	Model P4-X	4A1	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16				

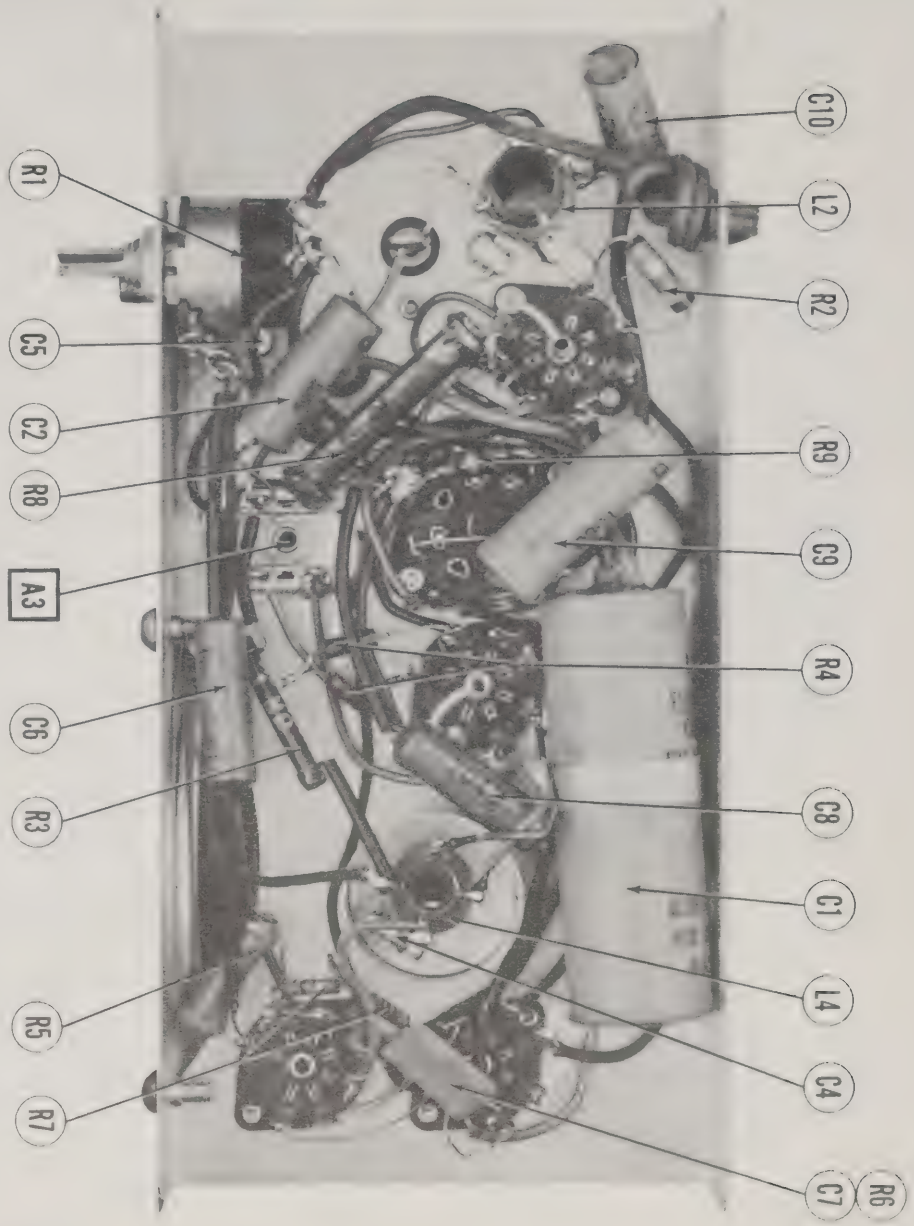
R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	KNIGHT PART No.	MEISSNER PART No.	
L1	Loop Ant.			N-8138		
L2	Osc. Coil	1Ω	8Ω	N-7139	14-1073	Connect 50MMF. Capacitor from high side of tuning cap to Osc. Grid
L3	Input IF	15Ω	15Ω	N-7888		
L4	Output IF	22.5Ω	22.5Ω	N-7542		

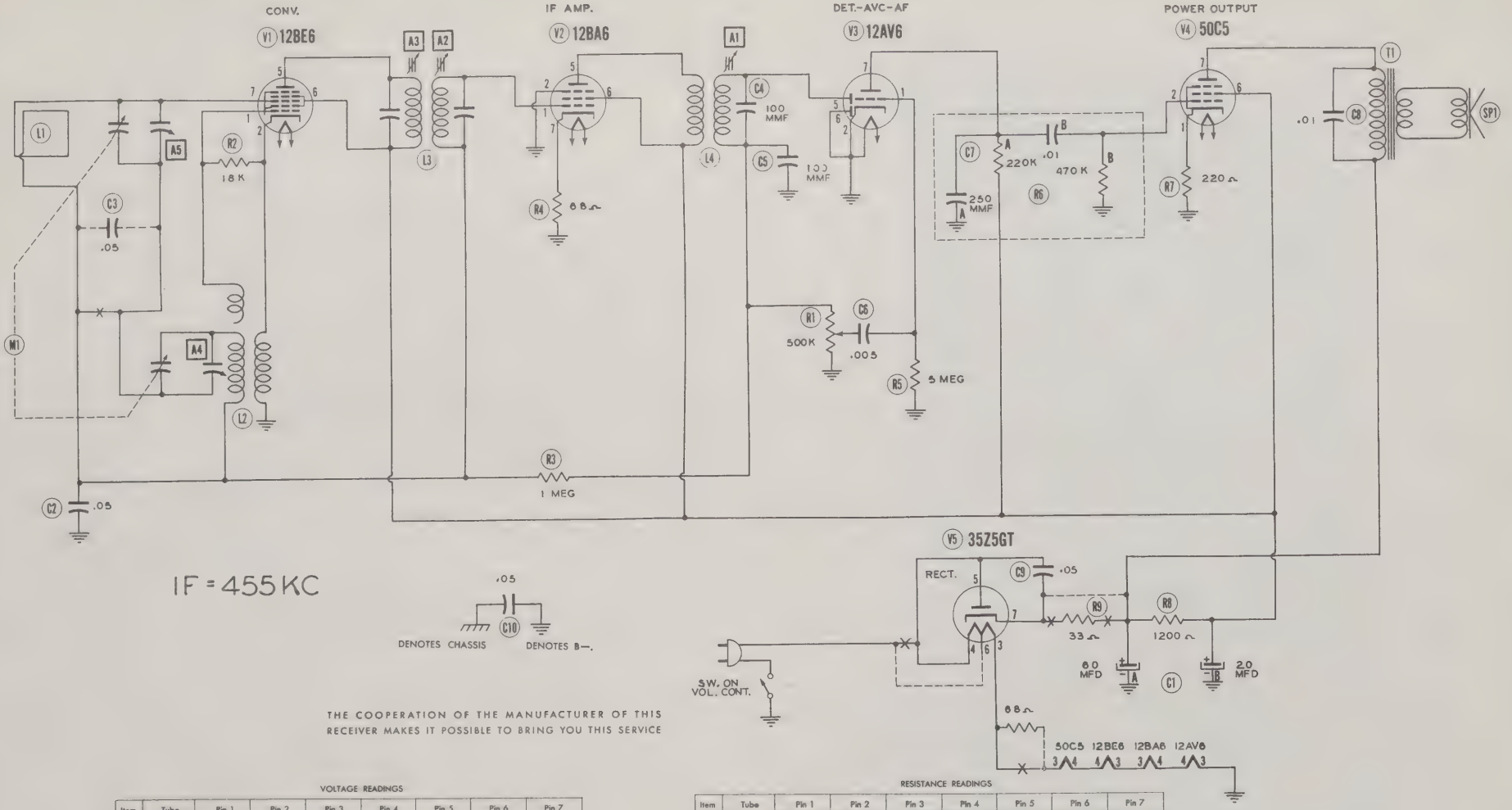
MISCELLANEOUS

ITEM No.	PART NAME	KNIGHT PART No.	NOTES
M1	Tuning Cap.		(44-432MMF, 35-150MMF)

CHASSIS—BOTTOM VIEW



KNIGHT MODEL 5R-570



IF = 455 KC

.05 C10

DENOTES CHASSIS — DENOTES B—.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	*-9VDC	0V	93VAC	35VAC	90VDC	90VDC	-.2VDC
V 2	12BA6	-.2VDC	0V	23VAC	11VAC	90VDC	90VDC	.7VDC
V 3	12AV6	-.4VDC	0V	0V	11VAC	-.4VDC	0V	65VDC
V 4	50C5	7VDC	0V	80VAC	35VAC	0V	90VDC	120VDC
V 5	35Z5	0V	117VAC	105VAC	80VAC	117VAC	125VDC	80VAC

* TAKEN WITH VTVM

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	18KΩ	.5Ω	26Ω	38Ω	†1200Ω	†1200Ω	1.5Meg.
V 2	12BA6	1.5Meg.	0Ω	26Ω	14Ω	†1200Ω	†1200Ω	68Ω
V 3	12AV6	5Meg.	0Ω	0Ω	14Ω	500KΩ	0Ω	†220K
V 4	50C5	220Ω	470KΩ	90Ω	38Ω	†Inf.	†1200Ω	†200Ω
V 5	35Z5	0Ω	120Ω	110Ω	90Ω	120Ω	50KΩ	90Ω

† TAKEN FROM PIN 8 OF V5

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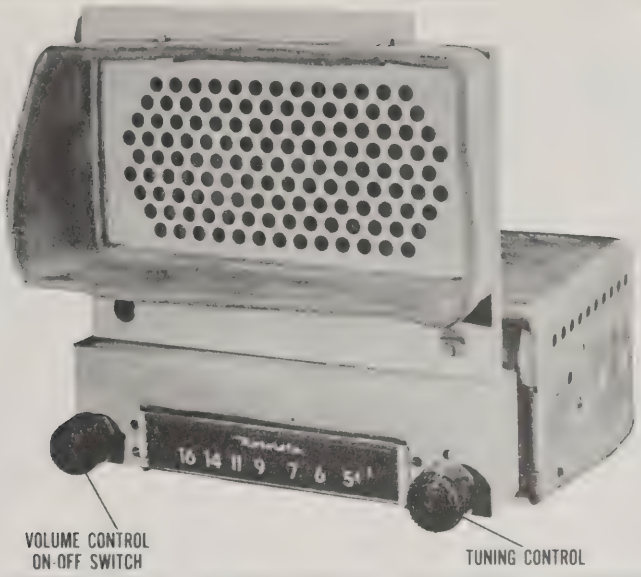
143-10

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



TRADE NAME	Motorola, Model CT1M
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Custom-Built 1951 Chevrolet Automotive Superheterodyne Receiver
TUBES (SIX)	Types 6BA6 RF Amp., 6BE6 Converter, 6BA6 IF Amp., 6AT6 Det.-AVC-AF, 6A25 Power Output, 6X4 Rectifier.
POWER SUPPLY	6Volt Storage Battery — RATING 5 Amp. @ 6.3Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning cores fully in and set the right hand edge of the pointer carriage to the reference mark at the right hand edge of dial backplate.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1Mfd.	High side to pin 7, (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod.)	Tuning cores fully out. (High frequency end).	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	High side thru dummy to antenna receptacle. Low side to chassis.	1605KC	"	"	A5	"
3.	"	"	1400KC	Tune for maximum output.	"	A6, A7	"
	The following should be performed only after tuner parts have been replaced or tuner tampered with.						
4.	Fig. 1	High side thru dummy to antenna receptacle. Low side to chassis.	1610KC	Tuning cores fully out. Adjust cores until they project 1-1/32 in. out of coil forms.	Across voice coil.	A5, A6, A7	Adjust for maximum output in the order given.
5.	"	"	1400KC	Set core carriage 29/64 in. from shield plate as shown in fig. 2.	"	A8, A9, A10	"
	After set is installed, fully extend the antenna and tune in a weak station near 1400KC. Retouch A7 for maximum volume.						

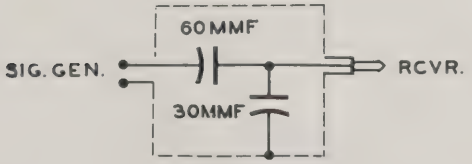


FIG. 1

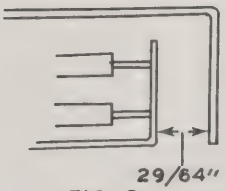


FIG. 2

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL CT1M

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det. -AVC-AF	6AT6	6AT6	7BT	
V5	Power Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	15	350	23A485677	AF32H4A		UP15S135C		TVL-3630	■ Filter
B	10	350							▲ Filter
C	20	25							Output Cathode
C2	90	500	21A591682						Fixed Trimmer
C3	.006	100	8A4529	P488-006		PTE6D6	GP2-333-602	6TM-D6	RF Coupling
C4	.05	100	8R13514	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C5	5		21K70720	SI5NPO			NPOK-050		RF Coupling
C6	47		21K77373	SI47N750	TCN-47		N750K-470	5TCU-Q47	Osc. Grid Cap.
C7	.05	400	8K14791	P488-05	DF-503	PTE4S5		4TM-S5	Osc. Anode Cap.
C8	.01	100	8R472754	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C9	.01	400	8R23690	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C10	500		21K481377	SI500	D6-501	5W5T5	GP2K-501	5GA-T5	Output Grid
C11	.004	400	8K71909	P688-004	D6-402	PTE6D4	GP2-333-402	6TM-D4	Output Plate
C12	.03	1000	8K400883	P1088-03		PTE16S3		MB-S3	Buffer Cap.
C13	.5	100	8K17028	P185-5		GT2P5		86P20	Hash Filter
C14	.5	100	8K17028	P185-5		GT2P5		86P20	Hash Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	250KΩ	½	18A510011	Q13-130			Volume Control-See Note
B	Switch		Not Req.	76-1			Attach to R1A Per Instructions.
C	Bushing		Not Req.	S-5			Attach to R1A

Note-Some models use 500KΩ control having part number 18K510011.

RESISTORS

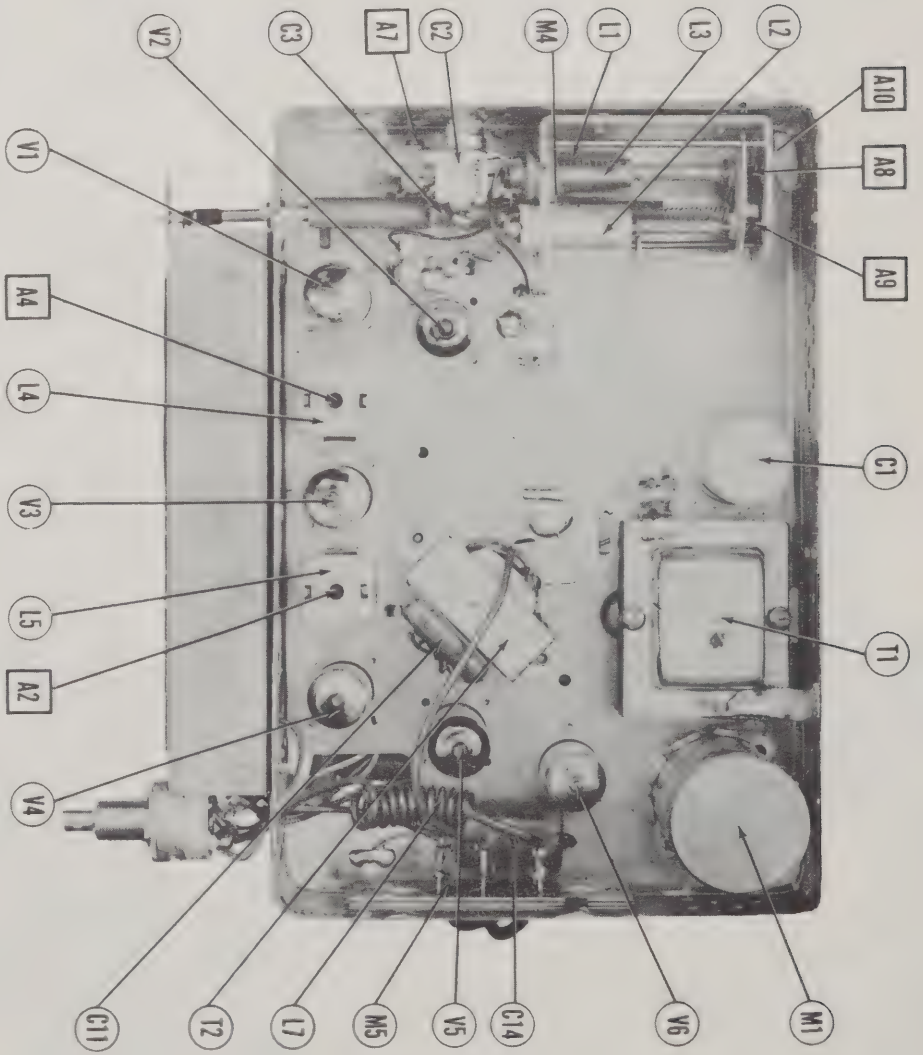
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
R2	470KΩ	½	6R6032	BTS-470K	RF Amp. Grid
R3	220Ω	½	6R3933	BTS-220	RF Amp. Cathode
R4	100KΩ	½	6R6075	BTS-100K	Conv. Grid
R5	47KΩ	½	6R6056	BTS-47K	Osc. Grid
R6	1Meg	½	6R6004	BTS-1Meg	AVC Network
R7	330Ω	½	6R6010	BTS-330	IF Amp. Cathode
R8	6800Ω	2	6R490001	BTB-6800	Decoupling
R9	4.7Meg	½	6R2122	BTS-4.7Meg	AF Amp. Grid
R10	470KΩ	½	6R6032	BTS-470K	AF Amp. Plate
R11	270KΩ	½	6R6414	BTS-270K	Output Grid
R12	270Ω	1	6R6336	BTA-270	Output Cathode
R13	2200Ω	1	6R488312	BTA-2200	Filter
R14	56Ω	½	6R5614		Hash Suppressor
R15	56Ω	½	6R5614		Hash Suppressor

TRANSFORMER (VIBRATOR)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	6.3VDC ②2.8A	420VCT .042VDC			25C501303			VT-1 ③ ④

③ Add series resistor to reduce plate voltage.
④ Drill new mounting holes.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T2	5.3KΩ	3.6Ω	405Ω	.62Ω	25B70171	A-3878	A-3026 ②	RO-9 ②	② Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
	FIELD RES.	V.C.IMP.				
SP1	4.5Ω	3.6Ω	50B510532	ST808 Mod. F69-V	57EV6	
SP1	PM		50K510064	⑤	57A1	⑤ Viking Part #57J9
	CONE DIA.	V.C.DIA.				
SP2	5"X7"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
L1	Ant. Coil	14Ω		24B502472		
L2	RF Coil	14Ω		24B502473		
L3	Osc. Coil	.6Ω	3.1Ω	24B502474		
L4A	1st IF	19Ω	19Ω	24B485553		
L4B	1st IF			24K502819		Alternate
L5	2nd IF	19Ω	19Ω	24K485554		
L6	Hash Choke	0Ω		24A472535		
L7	Hash Choke	0Ω		24K580706		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	RADIART PART No.	
M1	INT	6.3 VDC	115∿	48B3333	5342	5342	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			MOTOROLA PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M2	SFE	9Amp.	65K16248	9K580705 ①	307009	155009A	① This is assembly part number including holder complete with fuse.

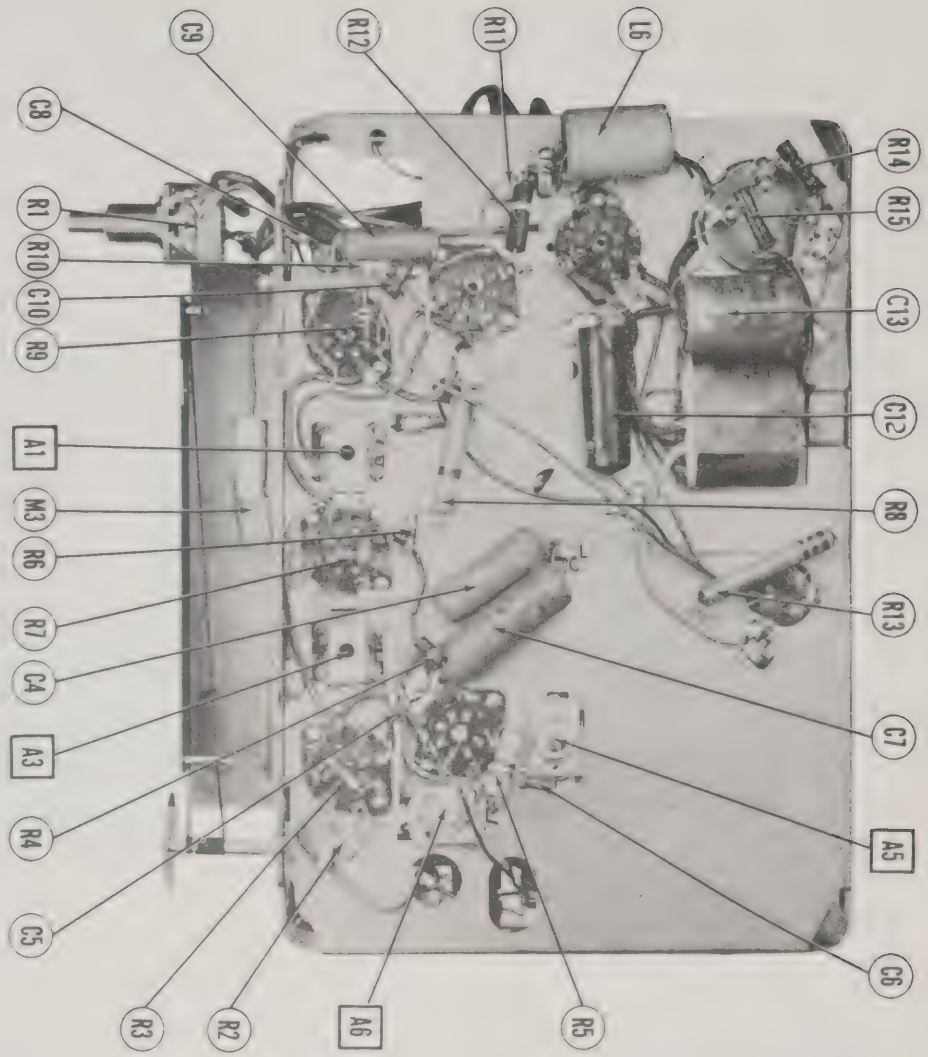
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					MOTOROLA PART No.		
M3	Bayonet	6-8	.25	Blue	65X10867		Type number 44.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuner Unit	51D502490	
M5	Spark Plate	1B501290	
A5	Trimmer	20A485708	Osc. Adj.
A6	Trimmer	20A481526	RF Adj.
A7	Trimmer	20A502328	Ant. Adj.
	Knob	26K510180	

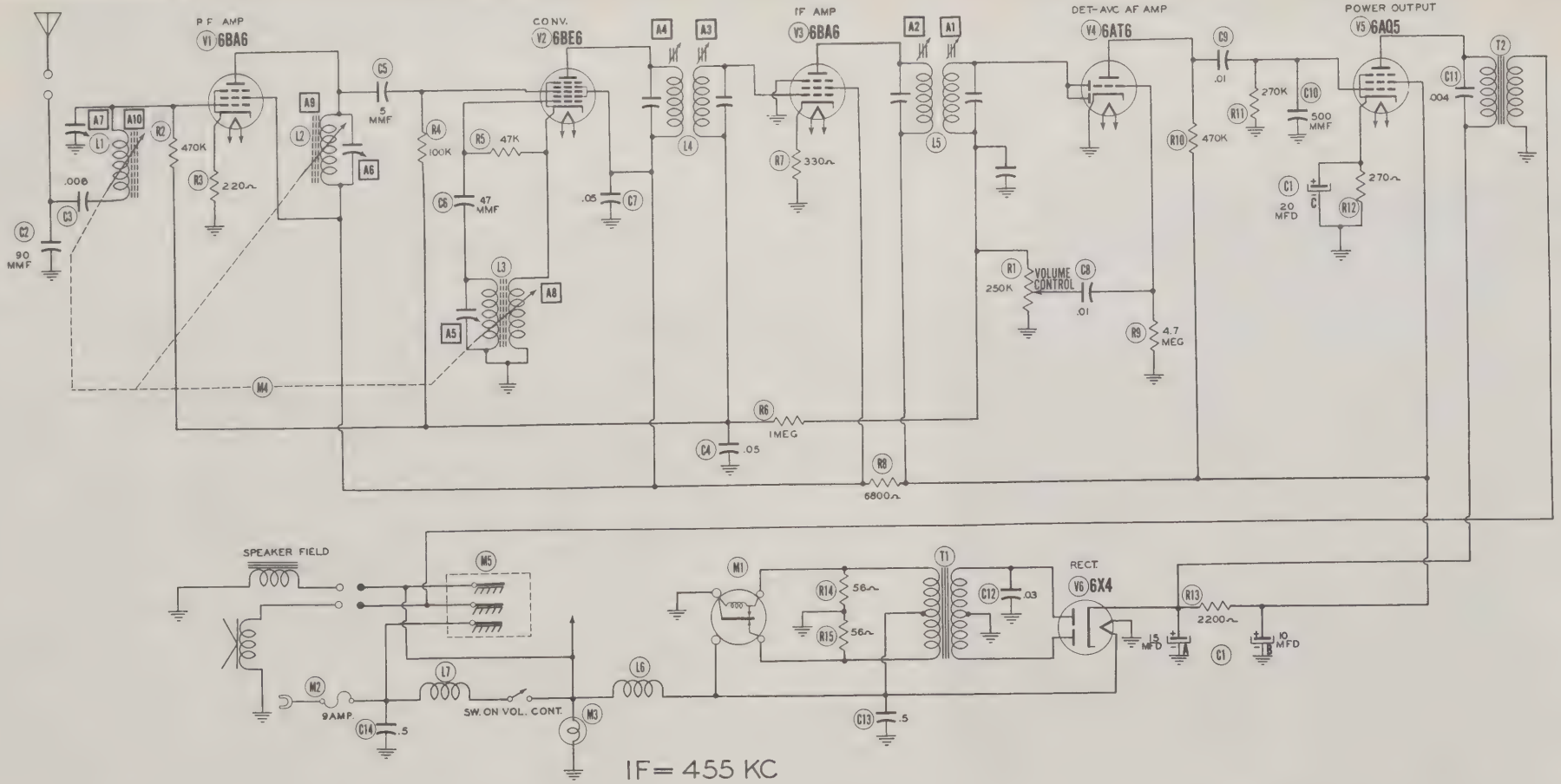
CHASSIS—BOTTOM VIEW



SET 143 FOLDER 11

MOTOROLA MODEL CTIM

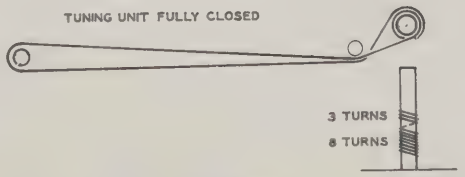
MOTOROLA MODEL CTIM



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	-1.1VDC	0V	0V	6VDC	70VDC	70VDC	4.6VDC
V 2	6BE6	8-5.5VDC	0V	0V	6VDC	70VDC	70VDC	-.2VDC
V 3	6BA6	-.1VDC	0V	0V	6VDC	150VDC	70VDC	1.6VDC
V 4	6AT6	-.4VDC	0V	0V	6VDC	-.3VDC	-.3VDC	47VDC
V 5	6AQ5	0V	7.4VDC	0V	6VDC	185VDC	150VDC	0V
V 6	6X4	270VAC	6VDC	5.8VDC	0V	0V	270VAC	195VDC

‡ TAKEN WITH VACUUM TUBE VOLTMETER.



DIAL CORD DRIVE

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	1.7Meg	0Ω	0Ω	.4Ω	†9KΩ	†9KΩ	220Ω
V 2	6BE6	47KΩ	.6Ω	0Ω	.4Ω	†9KΩ	†9KΩ	1.3Meg
V 3	6BA6	1.2Meg	0Ω	0Ω	.4Ω	†2.2KΩ	†9KΩ	330Ω
V 4	6AT6	4.7Meg	0Ω	0Ω	.4Ω	250KΩ	250KΩ	†470KΩ
V 5	6AQ5	270KΩ	270Ω	0Ω	.4Ω	†405Ω	†2.2KΩ	270KΩ
V 6	6X4	500Ω	.4Ω	.4Ω	0Ω	Inf.	500Ω	60KΩ

† MEASURED FROM PIN 7 OF V6.

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143-11

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery volage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

RCA VICTOR
MODEL 7T132 (Ch. KCS47D)

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RCA VICTOR
MODEL 7T132 (Ch. KCS47D)

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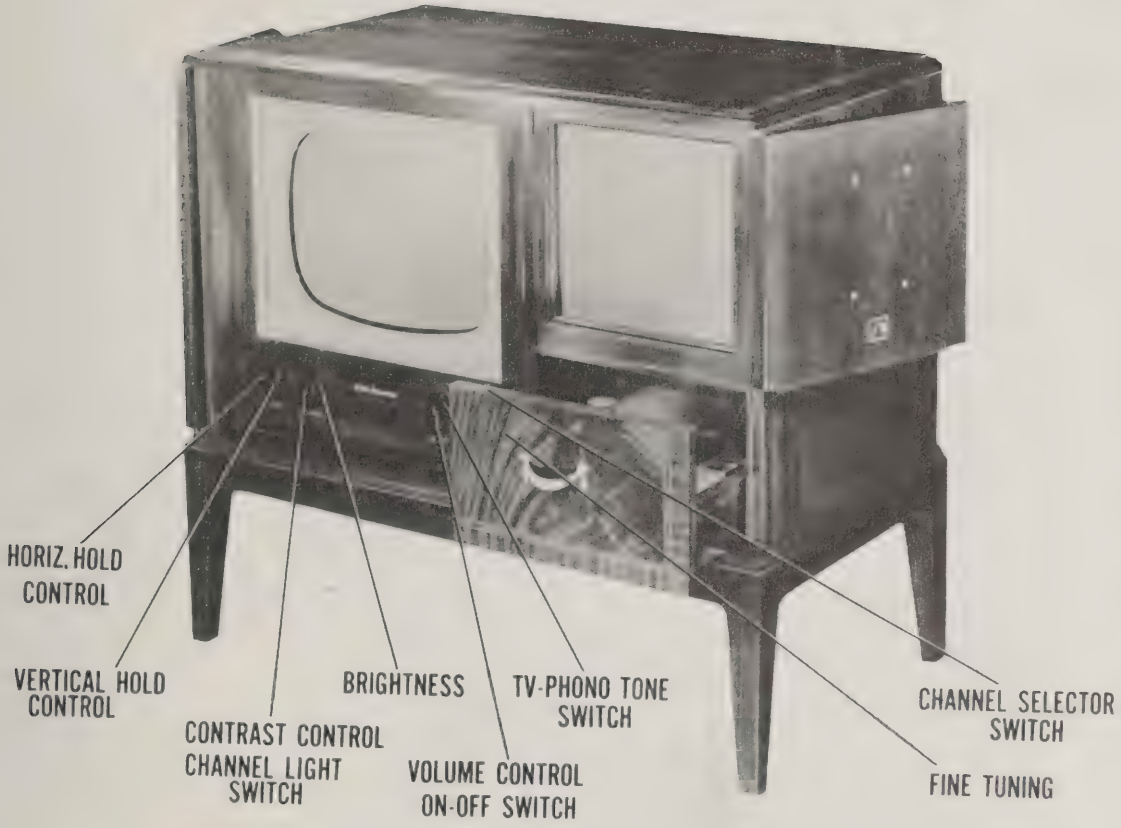
RCA VICTOR
MODEL 7T132 (Ch. KCS47D)



RCA VICTOR
MODEL 7T132 (Ch. KCS47D)

TRADE NAME	RCA Victor, Model 7T132 (Ch. KCS47D)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N. J.
TYPE SET	Television Receiver
TUBES	Twenty-four
POWER SUPPLY	110-120 Volts AC-60 Cycle — RATING 1.82 Amp. at 117 Volts AC
TUNING RANGE—CHANNELS	2 thru 13

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RECORD CHANGER UNIT - RCA VICTOR MODEL RP-190.

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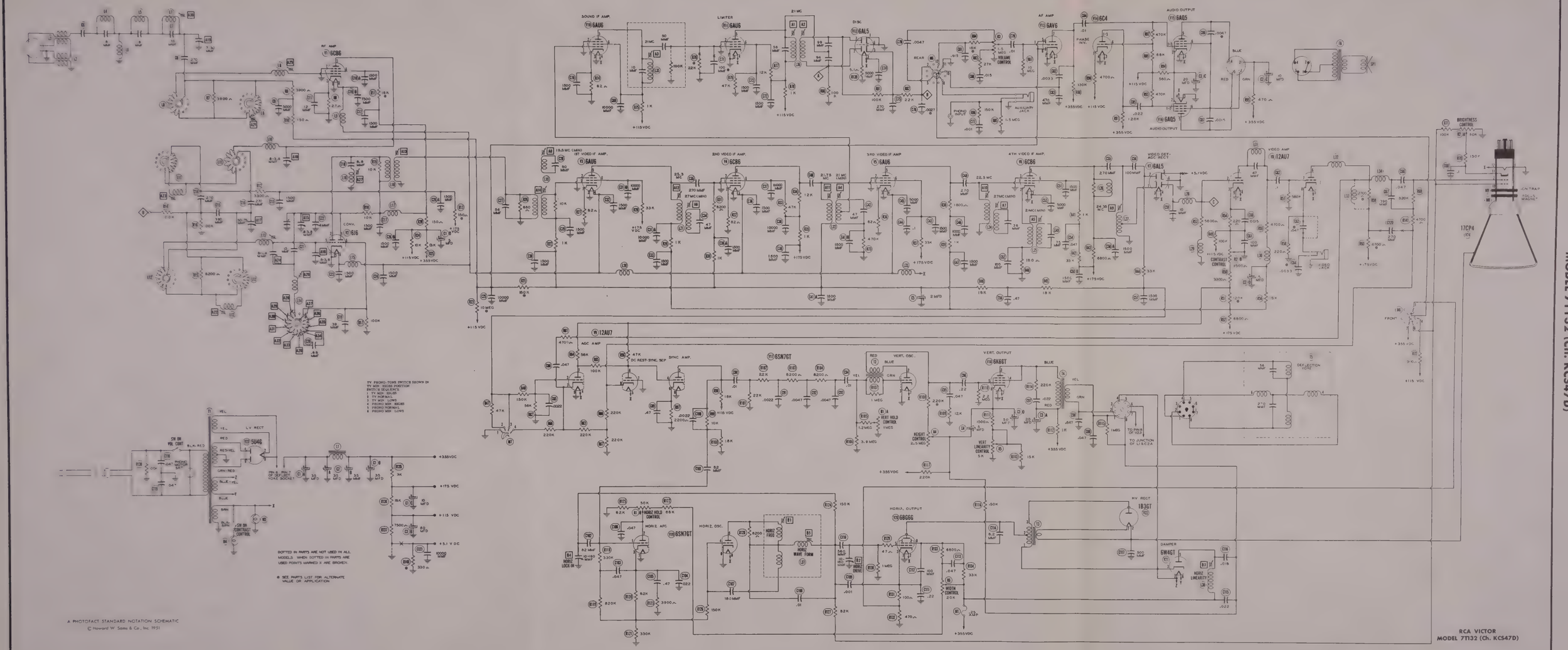
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MODEL 7T132 (Ch. KCS47D)
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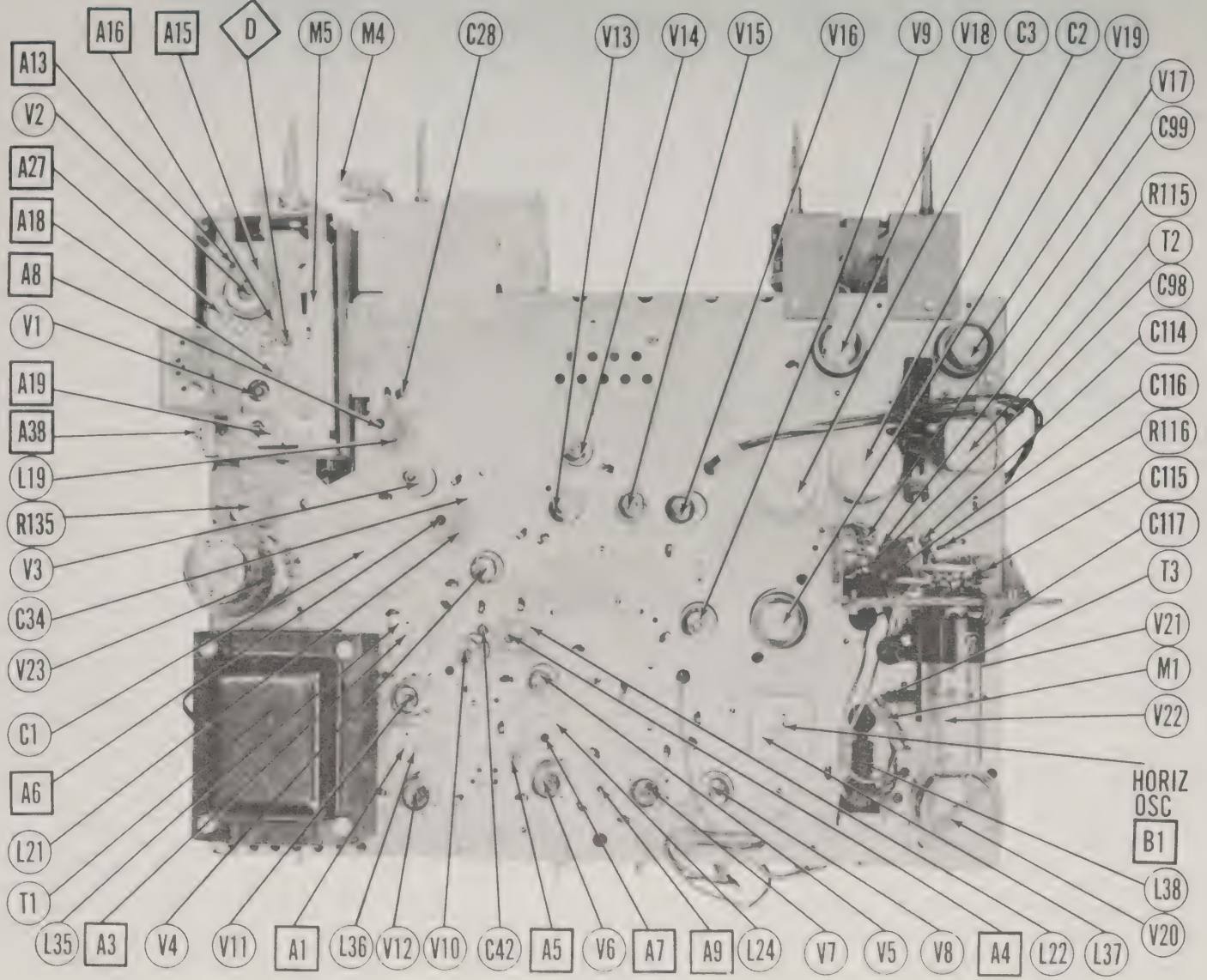
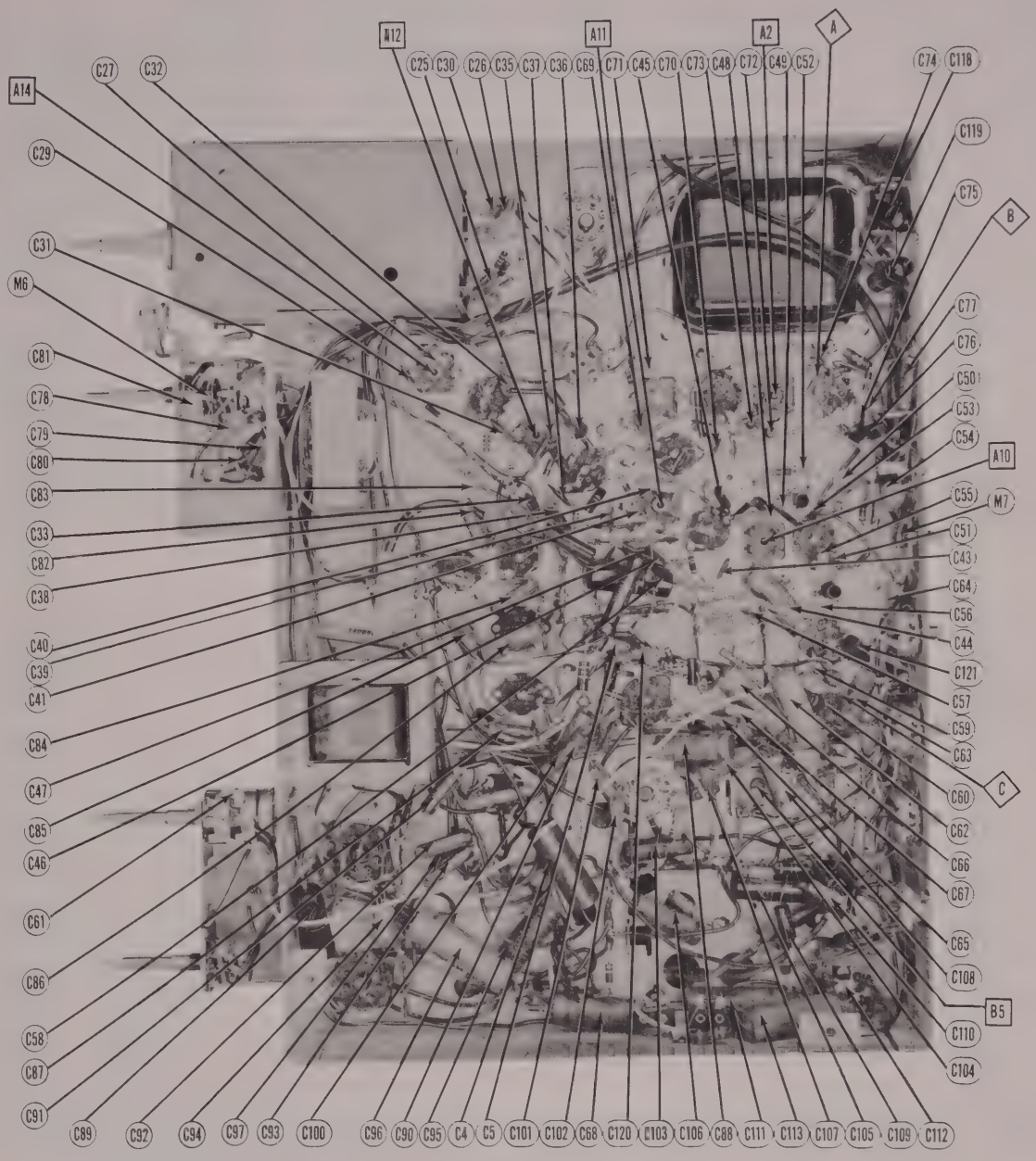
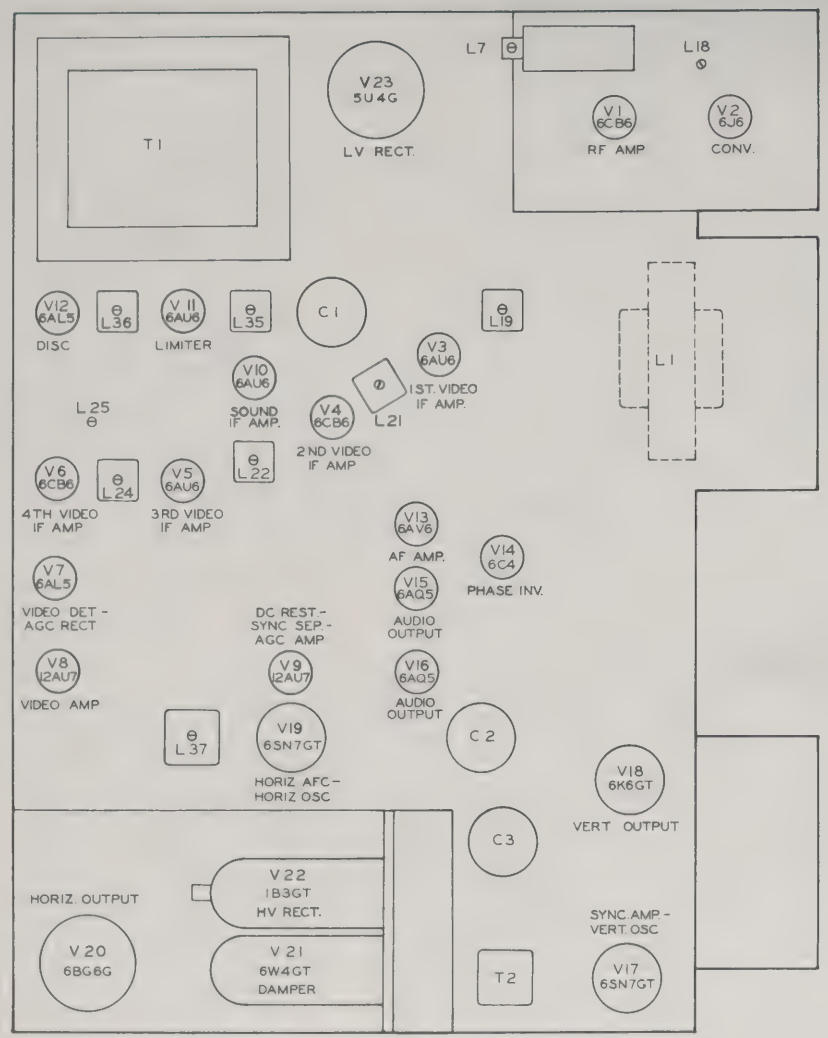
MODEL 7T132 (Ch. KCS47D)



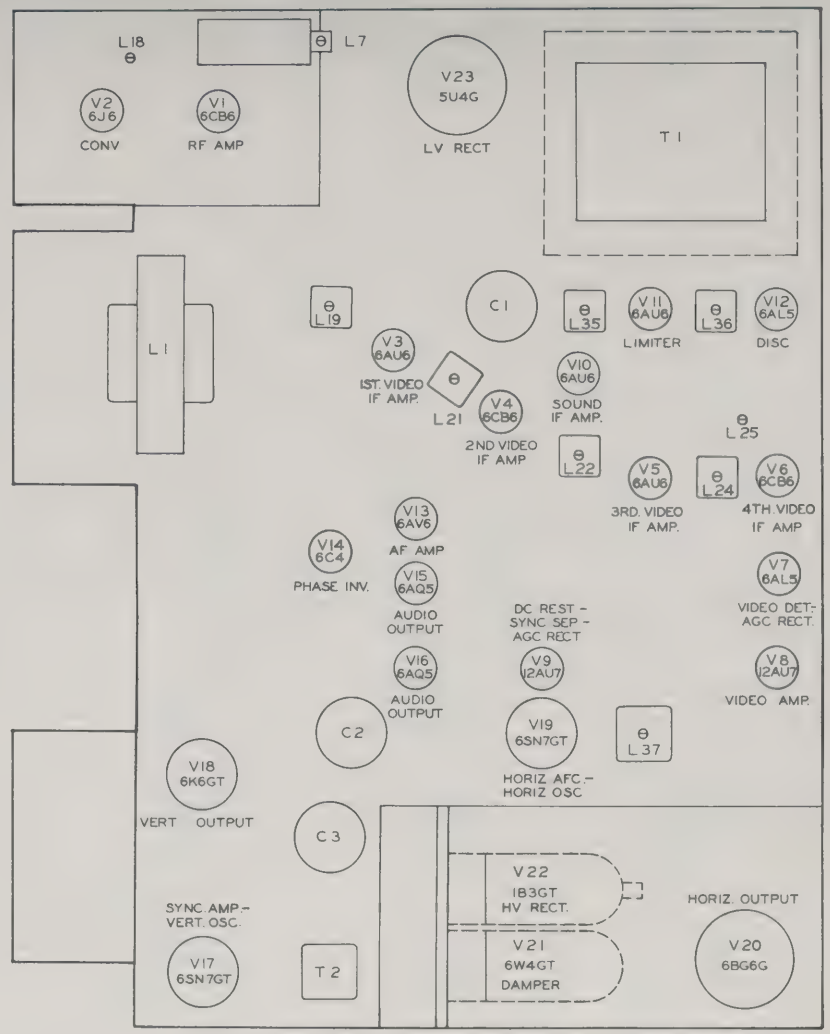
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

RCA VICTOR
MODEL 77132 (Ch. KCS47D)

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V19) from its socket.
The plug on the focus and deflection assembly must be in place to operate the set.
Remove the converter tube (V2) and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent erroneous indications.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD.	High side to pin 1 (Grid) of 6AU6 (V11). Low side to chassis.	21MC (Unmod.)	Any	DC Probe thru 1 Meg. to Point A . Common to chassis.	A1	Detune A2 to maximum counter-clockwise. Adjust A1 for maximum deflection.
2.	.001MFD.	"	"	"	DC Probe to Point B . Common to chassis.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.	.001MFD.	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	"	"	DC Probe thru 1 Meg. to Point A . Common to chassis.	A3	Adjust for maximum deflection.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 1 (Grid) of 6AU6 (V10). Low side to chassis.	21MC (450KC SWP)	21MC	Any	Vert. Amp. to Point A . Low side to chassis.	A1, A3	Adjust for maximum amplitude and symmetry as per figure 1.
2.	.001MFD	"	"	"	"	Vert. Amp. to Point B . Low side to chassis.	A2	Adjust A2 so 21MC occurs at center of crossover lines as per figure 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines. Continue with step 4.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the junction of R20 and R21 connect the positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	Not used	21MC	Any	Use VTVM DC Probe to Point C . Common to chassis.	A4, A5	Adjust for MINIMUM deflection.
5.	Direct	"	"	27MC	"	"	A6, A7	"
6.	Direct	"	"	19.5MC	"	"	A8	"
7.	Direct	"	"	24.35MC	"	"	A9	Adjust for maximum deflection.
8.	Direct	"	"	22.5MC	"	"	A10	"
9.	Direct	"	"	21.75MC	"	"	A11	"
10.	Direct	"	"	25.3MC	"	"	A12	"
11.	Direct	"	24MC (10MC SWP)	22.3MC	"	Vert. Amp. to Point C . Low side to chassis.	A13, A14	Connect 330Ω carbon resistors across R31, R34, R38, and L26. Adjust A13 and A14 for response curve similar to figure 3. Remove all 330Ω resistors.
12.	Direct	"	"	21.85MC 24.75MC 25.5MC 26.25MC	"	"		Check for response curve similar to figure 4. If necessary retouch A9 thru A14 for proper response.

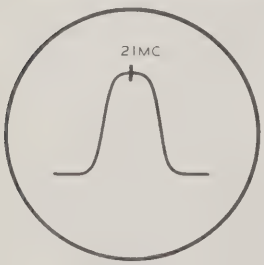


FIG. 1

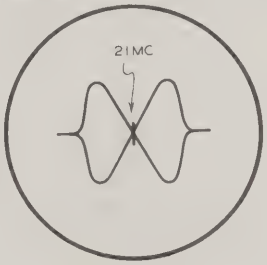


FIG. 2

FIG. 3

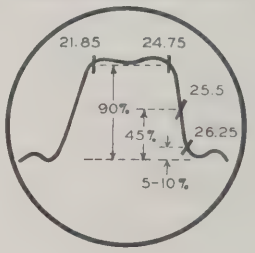


FIG. 4

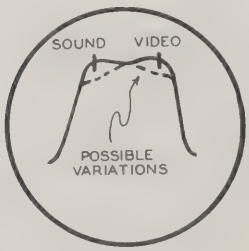
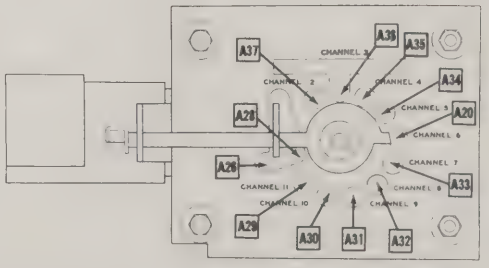


FIG. 5



OSCILLATOR ALIGNMENT POINTS

ALIGNMENT INSTRUCTIONS (CONT.)

RF TUNER ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Disconnect the co-ax link from terminal 2 of the tuner terminal board and connect a 39Ω carbon resistor across terminals 1 and 2.
Loosely couple the link to terminal 2 of the terminal board.
Connect the negative lead of the 3 volt battery to terminal 3 of the terminal strip, connect the positive lead to chassis.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Not used	215.75MC	13	VTVM DC Probe to Point B . Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
14.	"	"	183MC (10MC SWP)	181.25MC 185.75MC	8	SCOPE Vert. Amp. to Point D . Low side to chassis.	A16, A17, A18, A19	Adjust for response curve with band width shown in figure 5.
15.	"	"	Not used	87.75MC	6	VTVM DC Probe to Point B . Common to chassis.	A20	Adjust as in step 13.
16.	"	"	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. Amp. to Point D . Low side to chassis.	A21, A22, A23	Adjust for response similar to figure 5.
17.	Connect VTVM to Point D and adjust A24 for -3 volt reading. If necessary slightly retouch A21, A22, A23 and A17 for proper response on channel 6. Repeat these retouching adjustments until proper response is obtained with -3 volt reading at Point D .							
18.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	Not used	185.75MC	8	VTVM DC Probe to Point B . Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
19.	"	"	183MC (10MC SWP)	181.25MC 185.75MC	8	SCOPE Vert. Amp. to Point D . Low side to chassis.		Readjust A16, A17, and A19 for response curve, frequency and band width shown in figure 5.
20.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	A25	Adjust for maximum amplitude of response midway between the markers. Then overshoot the adjustment of turning the slug in the same direction a little more than required for maximum amplitude from the initial setting. Adjust A19 for maximum amplitude.
21.	"	"	Not used	215.75MC	13	VTVM DC Probe to Point B . Common to chassis.	A26	Adjust for zero reading as in step 18. Then overshoot the adjustment as in step 20. Adjust A15 to reset the oscillator to the proper frequency.
22.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	SCOPE Vert. Amp. to Point D . Low side to chassis.		Check all high band channels for proper response with markers above 80%. If markers do not appear within 80% repeat step 14. If A19 is adjusted, the adjustment should be overshot a small amount and compensated for by adjusting A25 for maximum amplitude between the sound and video markers. If the valley in the top of the curves on the high channels seems deeper than normal adjust A27 to flatten the curve. In later productions A27 may be fixed and will not require adjustment.
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
23.	Check the oscillator frequency for the high band channels. If the oscillator is off frequency, overshoot the adjustment of A15 and compensate for it by adjusting A26 for zero voltage at Point B.							
24.	Repeat step 15.							
25.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. Amp. to Point D . Low side to chassis.		Check for response curve similar to figure 5. If necessary retouch A21, A22, and A23 for proper response.
26.	Check the voltage at Point D . If necessary adjust A24 for -3 volt reading. If A24 is adjusted, turn channel selector to channel 8 and readjust A16 for proper response.							
27.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	85MC (10MC SWP)	83.25MC 87.75MC	6	SCOPE Vert. Amp. to Point D . Low side to chassis.		Check all low band channels for response similar to figure 5, and the injection voltage at Point D which should be -3 volts. Also recheck channels 7 thru 13.
28.	"	"	Not used	215.75MC	13	VTVM DC Probe to Point B . Common to chassis.		If necessary adjust A15 for zero voltage as in step 13.
29.	"	"	"	209.75MC	12	"	A28	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
				203.75MC	11		A29	
				197.75MC	10		A30	
				191.75MC	9		A31	
				185.75MC	8		A32	
				179.75MC	7		A33	
				87.75MC	6		A20	
				81.75MC	5		A34	
				71.75MC	4		A35	
				65.75MC	3		A36	
				59.75MC	2		A37	
30.	Turn channel switch to channel 8 and adjust A24 for proper response. When A24 is properly adjust the curve will be slightly wider with a slightly deeper valley at the top. Check all channel for: (1) proper response, (2) oscillator injection voltage at Point D , and (3) oscillator frequency. Make slight touch-up adjustments, if necessary. If A16 and A24 are changed considerably, retouch the oscillator frequency on all channels.							
31.	Disconnect the 39Ω resistor from terminals 1 and 2 on the terminal strip and reconnect the co-ax link. Repeat steps 11 and 12 of Video IF Alignment.							

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-.3VDC	.2VDC	0V	6.3VAC	145VDC	80VDC	0V		
V 2	6J6	50VDC	115VDC	0V	6.3VAC	-1VDC	§-2.8VDC	0V		
V 3	6AU6	-.1VDC	0V	0V	6.3VAC	90VDC	100VDC	.6VDC		
V 4	6CB6	-.2VDC	.6VDC	6.3VAC	0V	105VDC	80VDC	0V		
V 5	6AU6	-.1VDC	0V	0V	6.3VAC	90VDC	100VDC	.6VDC		
V 6	6CB6	0V	1.6VDC	6.3VAC	0V	140VDC	105VDC	0V		
V 7	6AL5	0V	0V	0V	6.3VAC	5.1VDC	0V	-.5VDC		
V 8	12AU7	90VDC	-.4VDC	6.2VDC	6.3VAC	6.3VAC	115VDC	0V	2VDC	0V
V 9	12AU7	1.8VDC	0V	1VDC	6.3VAC	6.3VAC	1.8VDC	0V	1.2VDC	0V
V 10	6AU6	-.2VDC	0V	0V	6.3VAC	105VDC	105VDC	.6VDC		
V 11	6AU6	-.6VDC	0V	0V	6.3VAC	105VDC	65VDC	0V		
V 12	6AU6	0V	-.6VDC	6.3VAC	1.1VAC	0V	0V	-.6VDC		
V 13	6AV6	-1.3VDC	0V	6.3VAC	0V	-.4VDC	-.4VDC	100VDC		
V 14	6C4	▲105VDC	▲0V	6.3VAC	0V	▲105VDC	▲0V	▲5.5VDC		
V 15	6AQ5	▲0V	▲16VDC	6.3VAC	0V	▲215VDC	▲220VDC	▲0V		
V 16	6AQ5	▲0V	▲16VDC	0V	6.3VAC	▲215VDC	▲220VDC	▲0V		
V 17	6SN7GT	§-64VDC	480VDC 140VDC	0V	§2.1VDC	51VDC	3.5VDC	6.3VAC	0V	
V 18	6K6GT	0V	0V	330VDC	330VDC	0V	30VDC 0V	6.3VAC	44VDC 30VDC	
V 19	6SN7GT	§-26.5VDC	125VDC 110VDC	-21VDC	§-75VDC	215VDC	0V	0V	6.3VAC	
V 20	6BG6G	355VDC	6.3VAC	8.2VDC	0V	-20VDC	0V	0V	320VDC	Top Cap *
V 21	6W4GT	0V	0V	540VDC	0V	360VDC	0V	540VDC	540VDC	
V 22	1B3GT	*	DO NOT MEASURE.							
V 23	5U4G	0V	360VDC	0V	350VAC	0V	350VAC	0V	360VDC	
V 24	17CP4	0V	.3VDC	Pin 10 355VDC	Pin 11 125VDC	Pin 12 6.3VAC	HV Connector * * 12K.V.			

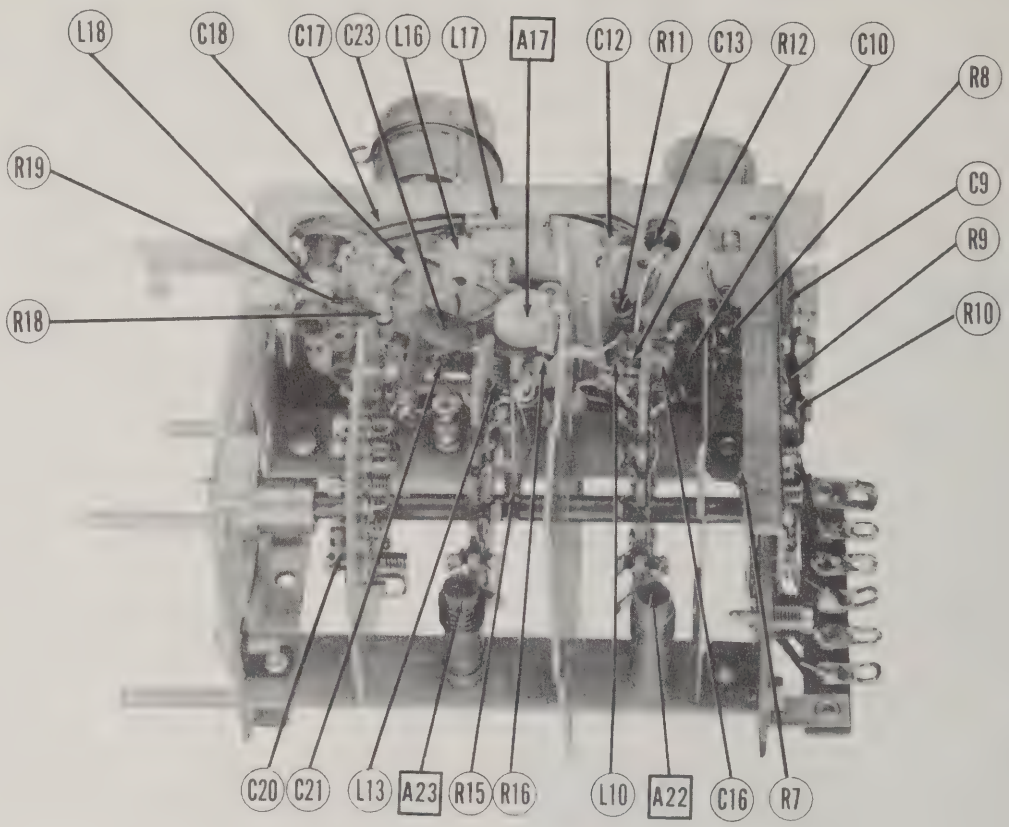
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
TV-PHONO SWITCH IN TV POSITION.
AGC SWITCH IN 3RD POSITION.
▲ MEASURED FROM 115VDC LINE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
* DO NOT MEASURE
** USE EXTREME CAUTION WHEN MEASURING THIS VOLTAGE

RESISTANCE READINGS

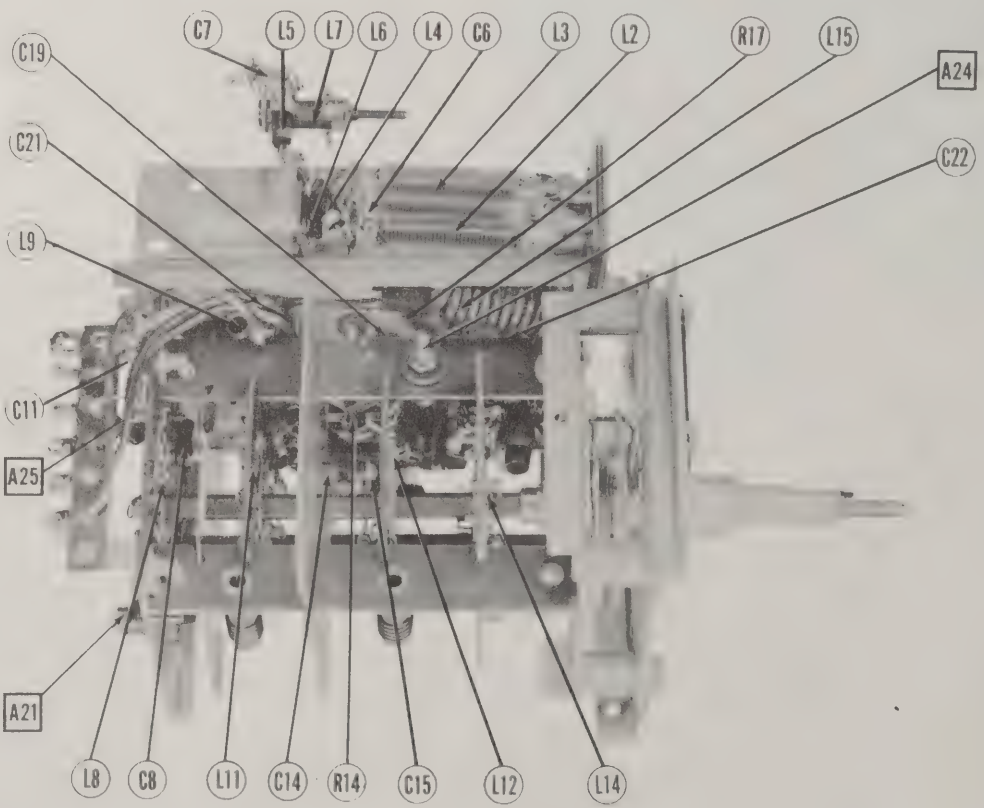
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	185KΩ	27Ω	0Ω	.1Ω	†6.4KΩ	†30KΩ	0Ω		
V 2	6J6	†17KΩ	†7KΩ	0Ω	.1Ω	100KΩ	100KΩ	0Ω		
V 3	6AU6	37KΩ	0Ω	0Ω	.1Ω	†10KΩ	†36KΩ	82Ω		
V 4	6CB6	45KΩ	82Ω	.1Ω	0Ω	†16KΩ	†51KΩ	0Ω		
V 5	6AU6	36KΩ	0Ω	0Ω	.1Ω	†10KΩ	†36KΩ	82Ω		
V 6	6CB6	.1Ω	180Ω	.1Ω	0Ω	†9.8KΩ	†37KΩ	0Ω		
V 7	6AL5	.1Ω	33KΩ	0Ω	.1Ω	330Ω	0Ω	5.6KΩ		
V 8	12AU7	†29KΩ	5.6KΩ	3.7KΩ	.1Ω	.1Ω	†10KΩ	560KΩ	220Ω	0Ω
V 9	12AU7	†50KΩ	38KΩ	170KΩ	.1Ω	.1Ω	†40KΩ	0Ω	440KΩ	0Ω
V 10	6AU6	470KΩ	0Ω	0Ω	.1Ω	†10KΩ	†10KΩ	82Ω		
V 11	6AU6	22KΩ	0Ω	0Ω	.1Ω	†10KΩ	†20KΩ	0Ω		
V 12	6AL5	0Ω	100KΩ	.1Ω	2.5Ω	200KΩ	0Ω	100KΩ		
V 13	6AV6	10Meg	0Ω	.1Ω	0Ω	185KΩ	185KΩ	†330KΩ		
V 14	6C4	†120KΩ	Inf.	.1Ω	0Ω	†120KΩ	▲68KΩ	▲4.7KΩ		
V 15	6AQ5	▲535KΩ	▲560Ω	.1Ω	0Ω	†815Ω	†515Ω	▲535KΩ		
V 16	6AQ5	▲470KΩ	▲560Ω	0Ω	.1Ω	†815Ω	†515Ω	▲470KΩ		
V 17	6SN7GT	1.4Meg	†3Meg †500KΩ	0Ω	†45KΩ	†20KΩ	2.2KΩ	.1Ω	0Ω	
V 18	6K6GT	Inf.	0Ω	†1.4KΩ	†1.4KΩ	2.2Meg	4KΩ 0Ω	.1Ω	5.3KΩ 1.5KΩ	
V 19	6SN7GT	1.5Meg	†50KΩ	410KΩ	480KΩ	†82KΩ	0Ω	0Ω	.1Ω	
V 20	6BG6G	†45Ω	.1Ω	100Ω	0Ω	1Meg	3.9KΩ	0Ω	†14KΩ †5KΩ	Top Cap #25Ω
V 21	6W4GT	Inf.	Inf.	360KΩ	Inf.	†82Ω	Inf.	#0Ω	#.2Ω	
V 22	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #260Ω
V 23	5U4G	Inf.	12KΩ	Inf.	33Ω	Inf.	35Ω	Inf.	12KΩ	
V 24	17CP4	0Ω	1.2Meg	Pin 10 †45Ω	Pin 11 200KΩ	Pin 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
TV-PHONO SWITCH IN TV POSITION.
AGC SWITCH IN 3RD POSITION.
† MEASURED FROM PIN 8 OF V23.
# MEASURED FROM PIN 3 OF V21.
▲ MEASURED FROM 115VDC LINE.

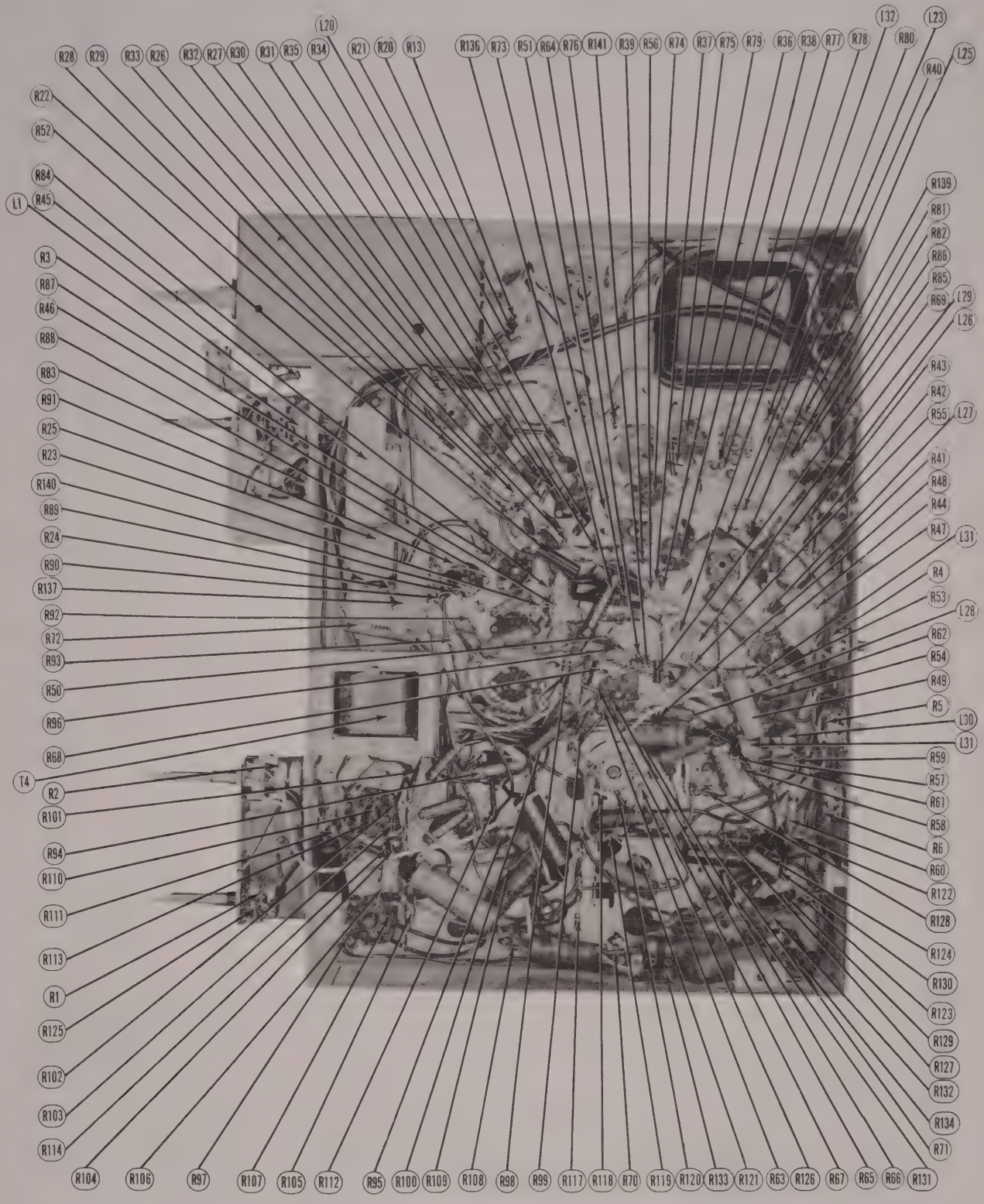
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



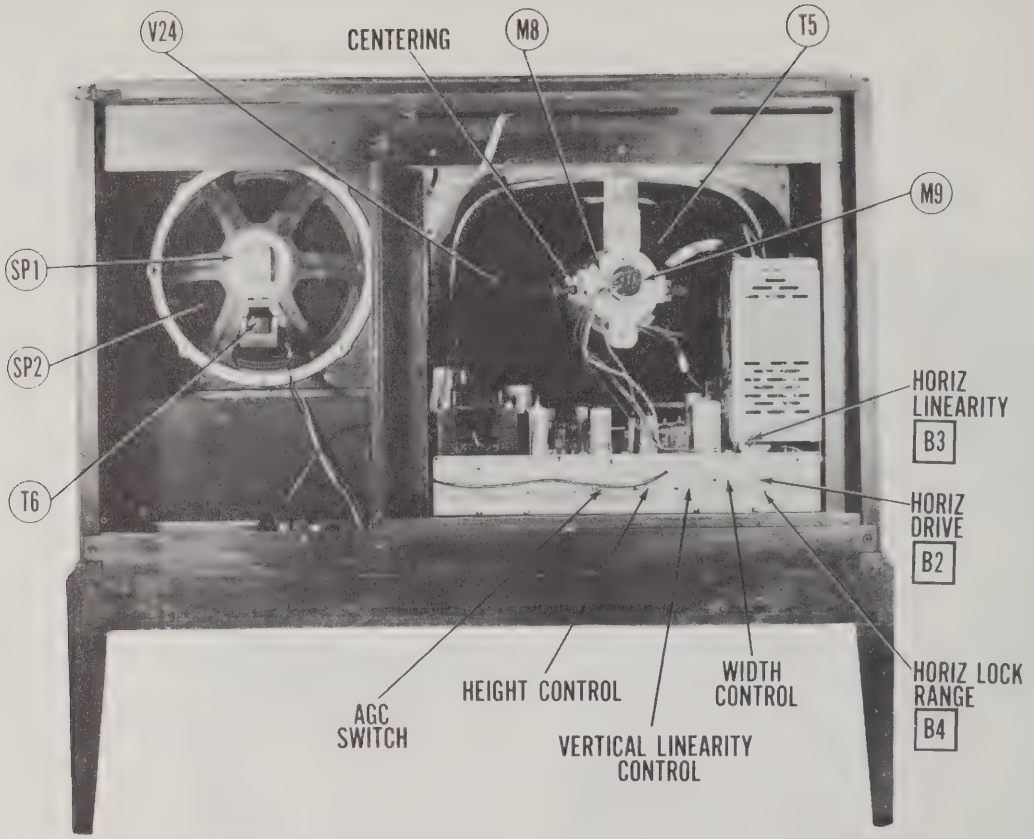
RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CABINET-REAR VIEW

MISCELLANEOUS ADJUSTMENTS

HORIZONTAL SWEEP CIRCUIT ADJUSTMENT

Connect a short between terminals C and D of L37.
Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to maximum clockwise and adjust the horizontal frequency slug (B1) until the blanking signal appears as a single vertical line in the picture.
Turn the hold control 1/4 turn counter-clockwise to synchronize the picutre.
Adjust the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right side of the picture.
Adjust the width control until picutre is of proper width.
Adjust the horizontal linearity slug (B3) until the picture is symmetrical from left to right, slight readjustment of B2 may be required for optimum results.
Turn the hold control fuuly counter-clockwise and interrupt the signal by switching to another channel and back again.
Turn the hold control clockwise and note the least number of bars present just before the picture pulls into synchronization.
Adjust the horizontal locking trimmer (B4) until 7 to 9 bars are present just before pull in.

HORIZONTAL WAVEFORM ADJUSTMENT

Remove the short from terminals C and D of L37.
Turn the horizontal hold control fully clockwise and adjust the waveform slug (B5) until the blanking signal appears as a single vertical line in the raster.
Turn the hold control 1/4 turn counter-clockwise to synchronize the picture.
Connect the vertical input of an oscilloscope to terminal C of L37.
Adjust the horizontal waveform slug (B5) until the broad and narrow peaks of the waveform are of equal height as shown in figure 6. If necessary during adjustment of B5 turn the hold control to keep the picture in synchronization.
Turn the hold control to maximum counter-clockwise and momentarily remove the signal. Adjust B4 until two bars are present just before The picture pulls into synchronization as the hold control is turned clockwise.
Turn the hold control to maximum clockwise and adjust B1 until the blanking bar appears in the raster.
Turn the hold control 1/4 turn counter-clockwise to synchronize the picture.

AGC SWITCH ADJUSTMENT

In a strong signal area the normal position of the switch is counter-clockwise. If interference of the impulse type is encountered turn the switch to the center position. In very weak signal areas, turn the switch clockwise.

FM TRAP ADJUSTMENT

If interference is encountered from a strong FM station signal it may be possible to eleminate it by adjusting A38. Adjust A38 for minimum interference in the picture.

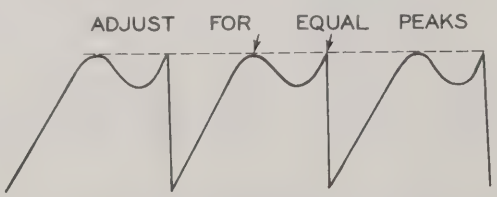


FIG. 6

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		RCA VICTOR PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6CB6	6CB6	6CK	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6CB6	6CB6	6CK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	4th. Video IF Amp.	6CB6	6CB6	6CK	
V7	Video Detector AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amplifier	12AU7	12AU7	9A	
V9	DC Restorer-Sync. Separater-AGC Amp	12AU7	12AU7	9A	
V10	Sound IF Amplifier	6AU6	6AU6	7BK	
V11	Limiter	6AU6	6AU6	7BK	
V12	Discriminator	6AL5	6AL5	6BT	
V13	AF Amplifier	6AV6	6AV6	7BT	
V14	Phase Inverter	6C4	6C4	6BG	
V15	Audio Output	6AQ5	6AQ5	7BZ	
V16	Audio Output	6AQ5	6AQ5	7BZ	
V17	Sync. Amplifier-Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V18	Vert. Output	6K6GT	6K6GT	7S	
V19	Horizontal AFC - Horiz. Oscillator	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6BG6G	6BG6G	5BT	
V21	Damper	6W4GT	6W4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3C	
V23	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	RCA VICTOR PART No.	SYLVANIA PART No.	THOMAS PART No.		
V24	17CP4	17BP4A ② ③	17BP4 ② ③		② Outer coating must be grounded. ③ High voltage connector must be changed. Replacements are glass equivalents of original.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	35	450	75510			UPT420			▲ Filter
B	35	450						TVL-3785	■ Filter
C	10	450						TVA-1601	▲ Filter
D	5	350							Decoupling
C2A	35	450	75510			UPT420			▲ Filter
B	35	450						TVL-3785	■ Filter
C	10	450						TVA-1601	▲ Audio Output Dec.
D	5	350							Video Amp. Dec.
C3A	20	450	75511			UPT421		TVL-4701	▲ Vert. Output Dec.
B	80	200						TVL-4701	■ Filter
C	20	200							▲ Audio Output Cath.
D	50	50							Vert. Output Cath.
C4	5	450	28417	PRS450/4		BR445		TVA-1702	Decoupling
C5	2	50	73747	PRS150/4		BBR2-50T		TVA-1301	AGC Filter
C6	100		75437	SI100	D6-101		GP1K-101	5GA-T1	RF Coupling
C7	39		75450		TCZ-39		NP0L-390		Fixed Trimmer
C8	270		75199	SI270	D6-271		GP2K-271	5GA-T27	RF Coupling
C9	5000		73473	BPD-005	DD-502		811-005	5HK-D5	RF Bypass
C10A	1500		75089	BPD-2X0015	DD-2-152		812-0015	5HK-2D15	RF Amp. Screen
B	1500								RF Amp. Fil.
C11	12		75200	SI12	D6-120		GP1K-120		RF Amp. Cathode
C12	1500		73748	SI1500	D6-152		GP2L-152	5HK-D15	RF Bypass
C13	1500		73748	SI1500	D6-152		GP2L-152	5HK-D15	RF Bypass
C14	270		75199	SI270	D6-271		GP2K-271	5GA-T27	RF Coupling
C15	390		75641	SI390	D6-391		GP2K-390		RF Coupling
C16	270		75199	SI270	D6-271		GP2K-271	5GA-T27	RF Coupling
C17	1500		73748	SI1500	D6-152		GP2L-152	5HK-D15	Conv. Dec.
C18	6.8		75197	SI6.8NP0	TCZ-6.8		NP0K-6R8		Fixed Trimmer
C19	39		75196		TCZ-39		NP0L-390		Fixed Trimmer
C20	.68		71504		TCZ-.68		NP0K-R68		Fixed Trimmer
C21	15		45465		TCZ-15		NP0K-150	5TCC-Q15	Osc. Feedback
C22	4		75289				NP0K-040		Fixed Trimmer
C23	1500		73748	BPD-0015	DD-152		801-0015	5HK-D15	Conv. Fil.
C24	1500		73748	BPD-0015	DD-152		801-0015	5HK-D15	Fil. Bypass
C25	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	AGC Filter
C26A	1500		75089	BPD-2X0015	DD-2-152	1W5D15	812-0015	5HK-2D15	RF Bypass
B	1500					1W5D15			RF Bypass
C27	56		71924		TCZ-56		NP0-333-560		Fixed Trimmer
C28	80				TCZ-82		NP0-333-820		Fixed Trimmer
C29	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C30	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	AGC Filter
C31A	10000		75877	BPD-01	DD-103	1D3S1	821-01	5HK-S1	1st. Video IF Amp. Plate
B	10000			BPD-01		1D3S1	821-01	5HK-S1	1st. Video IF Amp. Screen
C32	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	1st. Video IF Amp. Fil.
C33	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C34	47				TCZ-47		NP0L-470	5TCC-Q47	Fixed Trimmer
C35	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA RCA VICTOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C36A	1500		75089	BPD-2X0015	DD-2-152	1W-SD15	812-0015	5HK-2D15	AGC Filter
B	1500					1W-SD15			2nd. Video IF Amp. Fil.
C37	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	2nd. Video IF Amp. Screen
C38	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Bypass
C39	1500		73748	BPD-0015	DD-152	1W-SD15	801-0015	5HK-D15	RF Bypass
C40	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C41A	1500		75089	BPD-2X0015	DD-2-152	1W-SD15	812-0015	5HK-3D15	Sound IF Grid
B	1500					1W-SD15			
C42	47				TCZ-47		NP0L-470	5TCC-Q47	Fixed Trimmer
C43	1500		73748	BPD-0015	DD-152	1W-SD15	801-0015	5HK-D15	3rd. Video IF Screen
C44	1	400	73551	P488-1	DF-103	PTE4P1		4TM-P1	3rd. Video IF Screen
C45	5000		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Fil.
C46	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	RF Bypass
C47	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C48	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C49	75			SPT5NP0	TCZ-75		NP0J-333-750		Fixed Trimmer
C50A	1500		75089	BPD-2X0015	DD-2-152	1W-SD15	812-0015	5HK-2D15	4th. Video IF Dec.
B	1500					1W-SD15			RF Bypass
C51	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	4th. Video IF Screen
C52	100		45469	SI100NP0	TCZ-100		NP0-333-101	5TCC-T1	4th. Video IF Cathode
C53	5000		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th. Video IF Fil.
C54	047	400	75071	P488-047	DF-503	PTE4S5		4TM-S47	RF Bypass
C55	270	1000	73091	1468-00025	D6-271	5W5T25	GP2K-271	1FM-325	IF Coupling
C56	100		39396	SI100N750	TCN-100		NP50L-101	5TCU-T1	IF Coupling
C57	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	RF Bypass
C58	47	200	73787	P388-47		GT2P5		2TM-P47	AGC Filter
C59	10		53511	SI10NP0	TCZ-10		NP0K-100	5TCC-Q1	Video Det. Fil.
C60	.0015	400	73598	P688-0015	D6-152	1W5D15	GP2L-152	6TM-D15	Video Amp. Cathode
C61	100		39396	SI100N750	TCN-100		N750L-101	5TCU-T1	Contrast Cont. Shunt
C62	1	400	73551	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C63	047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Video Amp. Cathode *
C64	0033	600	73795	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Video Amp. Cathode †
C65	0022	600	73595	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	AGC Filter
C66	047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C67	390	1000	73094	1468-0004	D6-391	5W5T4	GP2K-391	MS-34	Video Coupling
C68	1	600	73557	P688-1	DF-104	PTE6P1		6TM-P1	Picture Tube Cathode
C69	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	Sound IF Decoupling
C70	1500		73748	BPD-0015	DD-152	1W5D15	801-0015	5HK-D15	Sound IF Cathode
C71	100		39396	SI100N750	TCN-100		N750L-101	5TCU-T1	Limiter Grid *
C72	1500		75166	SI1500	D6-152	1W5D15	GP2L-152	501C1	Limiter Plate Dec.
C73	1500		75166	SI1500	D6-152	1W5D15	GP2L-152	501C1	Limiter Screen
C74	5000		73473	BPD-005	DD-502	1D5D5	811-005	5HK-D5	Disc. Fil.
C75	270		75244	SI-270	D6-271	5W5T3	GP2K-271	5GA-T27	RF Bypass
C76	.0027	600	73599	P688-0022	D6-272	PTE6D2	GP2-333-222	6TM-D22	De-emphasis †
C77	001	600	75249	P688-001	D6-102	PTE6D1	GP2L-102	6TM-D1	Tone Comp.
C78	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Coupling
C79	01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C80	.015	200	73797	P488-015		PTE6S15		6TM-S15	Tone Comp.
C81	.015	200	73797	P488-15		PTE6S15		6TM-S15	Tone Comp.
C82	.0033	600	73795	P688-0033	D6-332	PTE6D3	GP2-333-332	6TM-D3	Tone Comp.
C83	470	500	39644	1468-0005	D6-471	5W5T5	GP2K-471	1FM-35	Tone Comp.
C84	01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Audio Coupling
C85	.022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	Audio Coupling
C86	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Audio Output Plate †
C87	0015	600	73598	P688-0015	D6-152	PTE6D3	GP2L-153	6TM-D15	Audio Output Plate
C88	047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Sync. Coupling
C89	47	200	73787	P288-47		GT2P5		2TM-P47	Sync. Amp. Cathode
C90	01	400	73561	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Vert. Sync. Coupling
C91	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Integrator Net.
C92	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Integrator Net.
C93	.0047	600	73920	P688-0047	D6-472	PTE6D5	GP2-333-472	6TM-D47	Integrator Net.
C94	01	600	73594	P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Vert. Sync. Coupling
C95	047	1000	73597	P1088-047		GT6S5		MB-S5	Vert. Discharge
C96	22	600	74957	684-25		GP6P25		6TM-P25	Vert. Sweep Coupling
C97	022	400	73562	P488-022		PTE4S2		4TM-S22	Vert. Shaping
C98	047	1000	73597	P1088-047		GT6S5		MB-S5	Fixed Trimmer
C99	047	1000	73597	P1088-047		GT6S5		MB-S5	Fixed Trimmer
C100	.0022	600	73595	P688-0022	D6-222	PTE6D2	GP2-333-222	6TM-D22	Horiz. Sync. Coupling
C101	82	1000	73090	BM82		5W5T1	GP1K-820	1FM-31	Horiz. Sync. Coupling
C102	82	1000	73090						Horiz. Feedback
C103	047	400	75071	P488-047	DF-503	PTE4S5		4TM-S47	AFC Filter
C104	022	400	73562	P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C105	47	200	73787	P288-47		GT2P5		2TM-P47	AFC Plate
C106	047	600	73592	P688-047	DF-503	PTE6S5		6TM-S47	Horiz. Osc. Grid
C107	180	1000	73102	1469-0002	D6-181	5R5T2		MB-32	Fixed Trimmer
C108	01	600	73594	P688-01	D6-103	PTE6S1		6TM-S1	Horiz. Discharge
C109	001	1000	75643	P1088-001		PTE16D1		MB-D1	Horiz. Sweep Coupling
C110	560	1000	74350	1468-0005	D6-561	1W5T6	GP2K-561	1FM-35	Horiz. Output Cathode
C111	22	400	73794	P488-22		GT4P25		2TM-P22	Horiz. Output Screen
C112	100		39396	SI100N750	TCZ-100		N750L-101	5TCU-T1	Horiz. Output Screen
C113	047	1000	73597	P1088-047		GT16S5		TR-15	Horiz. Sweep Coupling
C114	8.2		76009						Damper Filter
C115	022	1000	73810	P1088-022				MB-S22	Damper Filter
C116	018	1000	74727						HV Filter
C117	500	20000	74947	HV20A		TV1-S02			Line Filter
C118	047	400	75071	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter
C119	047	400	75071	P488-047	DF-503	PTE4S5		4TM-S47	Video Coupling
C120	270								RF Bypass
C121	10000		73960	BPD-01	DD-103	1D3S1	821-01	5HK-S1	

* Not used in all models.
† Some models use .0015 MFD in this application (Mfgr. Part # 73596)
‡ Some models use .0022 MFD in this application (Mfgr Part # 73595)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA VICTOR PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	75215	Concentrikit			
B	50KΩ	½		Bil-137 ♯	RTV-110	SBB-510	Vert. Hold Control - Front
C	Shaft			Bil-123♯			Horiz. Hold Control - Rear
R2A	50KΩ	½	75514	E-187 ♯			Attach per instructions in Concentrikit
B	3500Ω	½					Brightness Control - Front
							Contrast Control and Channel Light SW - Rear
R3A	1.5Meg	½	76171	Q18-139XX	AT-95	SBT-222-S	Volume Control
B	Shaft		Not req.	RQ	FKS-1/4	Not req.	Attach to R3A per instructions
C	Switch		Not req.	76-1	SWA	Not req.	Attach to R3A per instructions
R4A	2.5 Meg	½	71440	Q11-239	AG-84-S	AN-83	Height Control
B	Shaft		Not req.	Not req.	FSK-1/4	AK-1	Attach to R4A per instructions
R5A	5000Ω	½	71441	Q11-114	AM-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not req.	Not req.	FSK-1/4	AK-1	Attach to R5A per instructions
R6	20KΩ	½	75516				Width Control

♯ Additional parts to be used with Concentrikit.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA VICTOR PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R7	3900Ω	½		BTS-3900	Antenna Coil Shunt
R8	27Ω	½			RF Amp. Cathode
R9	3900Ω	½		BTS-3900	RF Amp. Grid
R10	150Ω	½		BTS-150	AGC Network
R11	18KΩ	½			RF Amp. Screen - See Note 2
R12	3300Ω	½		BTS-3300	RF Amp. Plate
R13	150Ω 20%	½		BTS-150	RF Amp. Plate Decoupling - See Note 3
R14	100KΩ	½		BTS-100K	Series Test Point
R15	8200Ω	½			RF Coil Shunt
R16	100KΩ	½			Conv. Grid
R17	100KΩ	½			Osc. Grid
R18	10KΩ	½			Osc. Plate
R19	10KΩ 5%	1			Conv. Transformer Shunt
R20	150Ω 30%	½	504115	BTS-150	Decoupling - See Note 3
R21	150KΩ	½	503415	BTS-150K	AGC Network - See Note 4
R22	1000Ω 20%	½	504210	BTS-1000	AGC Network
R23	10Meg	½	504610	BTS-10Meg	Voltage Divider - See Note 5
R24	10KΩ	2	523310	BTB-10K	Voltage Divider
R25	13KΩ	10	76282		Voltage Divider - Wire Wound
R26	680Ω	½	503168	BTS-680	1st. Video IF Transformer Shunt
R27	82Ω	½	503082	BTS-82	1st. Video IF Amp. Cathode
R28	33KΩ	½	503333	BTS-33K	1st. Video IF Amp. Screen
R29	1000Ω 20%	½	504210	BTS-1000	1st. Video IF Amp. Plate Decoupling
R30	1000Ω	½	503210	BTS-1000	AGC Network
R31	8200Ω 5%	½	14250	BTS-8200-5%	2nd. Video IF Amp. Grid
R32	82Ω 5%	½	503082	BTS-82-5%	2nd. Video IF Amp. Cathode
R33	47KΩ	½	503347	BTS-47K	2nd. Video IF Amp. Screen
R34	12KΩ 5%	1	30866	BTA-12K-5%	2nd. Video IF Amp. Plate
R35	1000Ω 20%	½	504210	BTS-1000	2nd. Video IF Amp. Decoupling
R36	82Ω	½	503082	BTS-82	3rd. Video IF Amp. Cathode
R37	33KΩ	½	503333	BTS-33K	3rd. Video IF Amp. Screen
R38	1800Ω	½	503218	BTS-1800	3rd. Video IF Amp. Plate
R39	1000Ω	½	503210	BTS-1000	3rd. Video IF Amp. Plate Decoupling
R40	180Ω	½	503118	BTS-180	4th. Video IF Amp. Cathode
R41	1000Ω 20%	½	504210	BTS-1000	4th. Video IF Amp. Screen
R42	33KΩ	½	503333	BTS-33K	4th. Video IF Amp. Screen Decoupling
R43	6800Ω	2	523268	BTB-6800	4th. Video IF Amp. Plate Decoupling
R44	33KΩ	½	503333	BTS-33K	AGC Network
R45	18KΩ	½	503318	BTS-18K	AGC Network
R46	18KΩ	½	503318	BTS-18K	AGC Network
R47	47KΩ	½	503347	BTS-47K	AGC Network
R48	150KΩ 20%	½	504415	BTS-150K	AGC Network
R49	100KΩ	½	503410	BTS-100K	Voltage Divider
R50	3300Ω 20%	½	504233	BTS-3300	Voltage Divider
R51	120KΩ	½	503412	BTS-120K	Voltage Divider - See Note 9
R52	6800Ω	2	523268	BW-2-6800	Decoupling - Wire Wound
R53	5600Ω	½	503256	BTS-5600	Video Det. Diode Load
R54	220Ω	1	513122	BW-1-220	Video Amp. Plate
R55	4700Ω	2	503247	BTS-4700	Video Amp. Plate
R56	15KΩ	1	513315	BW-1-15K	Video Amp. Plate Decoupling
R57	560KΩ	½	503456	BTS-560	Video Amp. Grid
R58	220Ω	½	503122	BW-½-220	Video Amp. Cathode
R59	2700Ω	½	503227	BTS-2700	Video Amp. Plate - See Note 6
R60	4700Ω	2	523247	BTB-4700	Video Amp. Plate - See Note 7
R61	4700Ω	½	503247	BTS-4700	Isolation
R62	56KΩ	½	503356	BTS-56K	AGC Amp. Grid
R63	220KΩ	½	503422	BTS-220K	AGC Amp. Cathode
R64	56KΩ	½	503356	BTS-56K	AGC Amp. Plate
R65	100KΩ	½	503410	BTS-100K	Isolation
R66	220KΩ	½	503422	BTS-220K	Voltage Divider
R67	220KΩ	½	503422	BTS-220K	Voltage Divider
R68	220KΩ	½	503422	BTS-220K	Voltage Divider
R69	820KΩ	½	503482	BTS-820K	Picture Tube Grid
R70	150KΩ 20%	½	504415	BTS-150K	Picture Tube Cathode
R71	100KΩ	1	513410	BTA-100K	Voltage Divider
R72	900Ω	5	76281	1 3/4A-900	Voltage Divider - Wire Wound
R73	470KΩ	½	503447	BTS-470K	Sound IF Amp. Grid
R74	82Ω 5%	½	503082	BTS-82-5%	Sound IF Amp. Cathode
R75	1000Ω	½	503210	BTS-1000	Sound IF Amp. Decoupling
R76	22KΩ	½	503322	BTS-22K	Limiter Grid - See Note 1
R77	12KΩ	½	503312	BTS-12K	Limiter Screen
R78	1000Ω 20%	½	504210	BTS-1000	Limiter Decoupling
R79	47KΩ	½	503347	BTS-47K	Voltage Divider
R80	100KΩ	½	503410	BTS-100K	Disc. Diode Load
R81	100KΩ	½	503410	BTS-100K	Disc. Diode Load
R82	22KΩ	½	503322	BTS-22K	De-emphasis
R83	27KΩ	½	503327	BTS-27K	Tone Compensation
R84	15KΩ	½	503315	BTS-15K	Tone Compensation - See Note 2
R85	1.5Meg	½	503515	BTS-1.5Meg	Tone Compensation
R86	150KΩ	½	503415	BTS-150K	Tone Compensation

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA VICTOR PART No.	IRC PART No.	IDENTIFICATION CODES
R87	10Meg 20%	½	504610	BTS-10Meg	AF Amp. Grid
R88	330KΩ	½	503433	BTS-330K	AF Amp. Plate
R89	68KΩ	½	503368	BTS-68K	Phase Inv. Grid
R90	4700Ω	½	503347	BTS-4700	Phase Inv. Cathode
R91	120KΩ	½	503413	BTS-120K	Phase Inv. Plate
R92	470KΩ	½	503447	BTS-470K	Output Grid
R93	470KΩ	½	503447	BTS-470K	Output Grid
R94	560Ω	2	523156	BTB-560	Output Cathode
R95	470Ω	1	513147	BTA-470	Output Decoupling
R96	47KΩ	1	513347	BTA-47K	Sync. Sep. Plate
R97	2200Ω 20%	½	504222	BTS-2200	Sync. Amp. Cathode
R98	18KΩ	1	513318	BTA-18K	Sync. Amp. Plate
R99	10KΩ	½	503310	BTS-10K	Isolation
R100	18KΩ	½	503318	BTS-18K	Voltage Divider
R101	22KΩ	½	503322	BTS-22K	Voltage Divider
R102	22KΩ	½	503322	BTS-22K	Integrator
R103	8200Ω	½	503282	BTS-8200	Integrator
R104	8200Ω	½	503282	BTS-8200	Integrator
R105	1.2Meg 5%	½	30162	BTS-1.2Meg-5%	Vert. Osc. Grid
R106	3.9Meg	½	503539	BTS-3.9Meg	Vert. Osc. Grid
R107	1Meg 20%	½	504510	BTS-1Meg	Vert. Osc. Transformer Shunt
R108	220KΩ	½	503422	BTS-220K	Vert. Osc. Plate - See Note 8
R109	12KΩ 5%	½	30436	BTS-12K-5%	Vert. Peaking
R110	2.2Meg	½	503522	BTS-2.2Meg	Vert. Output Grid
R111	1500Ω	1	513215	BTA-1500	Vert. Output Cathode
R112	1000Ω 20%	½	504210	BTS-1000	Vert. Output Decoupling
R113	15KΩ	½	503315	BTS-15K	Vert. Linearity Control Shunt
R114	220KΩ	½	503422	BTS-220K	Damping
R115	1Meg	½	503510	BTS-1Meg	Damping
R116	150KΩ 20%	1	503415	BTS-150K	Voltage Divider
R117	220KΩ	½	503422	BTS-220K	Voltage Divider
R118	330KΩ	½	503433	BTS-330K	Horiz. AFC Grid
R119	820KΩ	½	503482	BTS-820K	Horiz. AFC Grid
R120	82KΩ	½	503382	BTS-82K	Horiz. AFC Cathode
R121	330KΩ 5%	1	38892	BTA-330K-5%	Horiz. AFC Cathode
R122	68KΩ	1	513368	BTA-68K	Horiz. AFC Plate
R123	3900Ω	½	503239	BTS-39K	Horiz. AFC Filter
R124	150KΩ 20%	1	514415	BTA-150K	Horiz. Feedback
R125	82KΩ	1	513382	BTA-82K	Voltage Divider
R126	150KΩ 5%	1	31895	BTA-150K-5%	Horiz. Osc. Grid
R127	82KΩ 5%	1	52609	BTA-82K-5%	Horiz. Osc. Plate
R128	8200Ω 5%	½	14250	BTS-8200-5%	Horiz. Osc. Coil Shunt
R129	47Ω 20%	½	504047		Parasitic Suppressor
R130	1Meg	½	503510	BTS-1Meg	Horiz. Output Grid
R131	100Ω	2	523110	BW-2-100	Horiz. Output Cathode - Wire Wound
R132	470Ω	4	76280		Horiz. Output Cathode - Wire Wound
R133	6800Ω	1	513268	BTA-6800	Horiz. Output Screen
R134	33KΩ	½	503333	BTS-33K	Horiz. Output Screen
R135	3000Ω	15	76267	2D-3000	Voltage Divider - Wire Wound
R136	18KΩ	10	76265	1 3/4A-18K	Voltage Divider - Wire Wound
R137	7500Ω	10	76266	1 3/4A-7500	Voltage Divider - Wire Wound
R138	100KΩ	2	523410	BTB-100K	Isolation - See Note 1
R139	5.1	½	72067	BW-½-5.1	Disc. Diode Filament - Wire Wound
R140	330Ω	1		BTA-330	Bias Network - See Note 1
R141	4700Ω	½	503247	BTS-4700	Isolation

Note 1 Not used in all models.
Note 2 Some models use 22KΩ resistor in this application.
Note ♯ Some models use 100Ω resistor in this application.
Note 4 Some models use 33KΩ resistor in this application.
Note 5 Some models use 2.2Meg resistor in this application.
Note 6 Some models use 10KΩ resistor in this application.
Note 7 Some models use 6800Ω resistor in this application.
Note 8 Some models use 270KΩ resistor in this application.
Note 9 Some models use Parallel Resistors in this application to obtain desired value.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	760VCT	5VAC	6.3VAC	75508			
	ⓟ1.82A	.225ADC	ⓢ 3A	ⓢ 7A				
				SEC. 4				
				6.3VAC				
				ⓢ 1.2A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	165Ω	1310Ω	74144	A-8122	A-4000 ①	TBO-2	Vert. block osc. trans. Horiz. output trans.
T3	260Ω	0Ω	75585				
	Tap 25Ω						
T4	400Ω	.32Ω	74950				Vert. output trans. Horiz. deflection coil.
T5A	43Ω		74952				Vert. deflection coil.
B	3.5Ω						

① Drill one new mounting hole.

RCA VICTOR MODEL 7T132 (Ch. KCS47D)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T6	8.5KΩ CT	4Ω	600Ω CT	.45Ω	76271	A-3830①	A-2938 ①	RO-110 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	RCA PART No.	VIKING PART No.	QUAM PART No.	
SP1	PM	4Ω	75681	12J12	12A4A	
	CONE DIA.	V. C. DIA.				
SP2	11 5/8	1"	75682			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	RCA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.225A	45Ω	1.1 Henries	73154	C-2326 ①	C-2991	TR-3300	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	RCA VICTOR PART No.	MEISSNER PART No.	
L2	Ant. Coil	.6Ω	.3Ω	73591		Part of Ant. Matching Trans. Part # 75509
L3	Ant. Coil	.6Ω	.3Ω			Part of Ant. Matching Trans. Part # 75509
L4	IF Trap	.2Ω		75242		Part of Ant. Matching Trans. Part # 75509
L5	IF Trap	.2Ω		75242		Part of Ant. Matching Trans. Part # 75509
L6	Ant. Shunt	.3Ω		75241		Part of Ant. Matching Trans. Part # 75509
L7	FM TRap	0Ω		75449		
L8	Ant. Coils	0Ω				
L9	Fil. Choke	0Ω				
L10	RF Coil	0Ω				
L11	RF Coils	0Ω				
L12	Mixer Grid Coils	0Ω				
L13	Mixer Grid Coil	0Ω				
L14	Osc. Coils	0Ω				
L15	Fil. Choke	0Ω				
L16	Mixer Plate Loading Coil	0Ω				
L17	RF Choke	.3Ω				
L18	Conv. Plate Coil	.3Ω	.1Ω	75181		
L19	1st. Video IF	.1Ω	.6Ω	754589		Includes Trap 0Ω
L20	Fil. Choke	0Ω		73477		
L21	2nd. Video IF	.2Ω		74590		Includes Trap 0Ω
L22	3rd. Video IF and Sound Takeoff	.3Ω	0Ω	76264		
L23	Fil. Choke			73477		
L24	4th. Video IF	.1Ω		73574		Includes Trap
L25	Sound Trap	.1Ω	.1Ω	71778		Includes C49
L26	RF Choke	3Ω		76011		36 Microhenries Wound on 22KΩ Resistor
L27	5th. Video IF	.1Ω		75210		
L28	Peaking	2.8Ω		75299		36 Microhenries (Orange and White Dots)
L29	Peaking	13Ω		75253	19-1923	500 Microhenries (Green and White Dots)
L30	Peaking	2.6Ω		71793		36 Microhenries (Black Dot)
L31	4.5MC Trap	2.7Ω		75251		
L32	Peaking	13Ω		75252	19-1923	500 Microhenries (Green and White Dots)
L33	Peaking			76132	19-1923	500 Microhenries (Blue and Green Dots)
L34	Peaking	5.5Ω		75253	19-1921	120 Microhenries (Blue and Red Dots)
L35	Sound IF	.1Ω		75211		
L36	Disc. Trans.	.1Ω	.1Ω	75212		
L37	Horiz. Osc. Trans.	35Ω	80Ω	75213		Tap at C to D=38Ω
L38	Horiz. Lin.	37Ω		71449		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA				REMARKS
			RCA VICTOR PART No.		LITTELFUSE PART No.		
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG Pigtail	.250A			318.250		

PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					RCA VICTOR PART No.		
M3	Bayonet	7.5	.2	White	11765		Type # 51
M4	Bayonet	7.5	.2	White	11765		Type # 51

MISCELLANEOUS

ITEM No.	PART NAME	RCA VICTOR PART No.	NOTES
M5	RF Tuner		
M6	Switch	76172	Function (TV-Phono-Tone)
M7	Switch		AGC
M8	Focus Magnet	76168	
M9	Ion Trap	74953	
	Ant. Matching Trans.	75509	
B2, B4	Trimmer	76217	10-160 MMF.,(Horiz. Drive and Horiz. Locking)
	Knob	73995	Fine Tuning (Tan for Maple Instruments)
	Knob	74959	Fine Tuning (Maroon for Mahogany or Walnut Instruments)
	Knob	75461	Fine Tuning (Beige for Oak Instruments)
	Knob	74960	Channel Selector (Maroon for Mahogany or Walnut Instruments)
	Knob	75462	Channel Selector (Beige for Oak Instruments)
	Knob	74961	Channel Selector (Tan for Maple Instruments)
	Knob	74962	Brightness and Vert. Hold (Marron for Mahogany or Walnut Inst.)
	Knob	75463	Brightness and Vert. Hold (Beige for Oak Instruments)
	Knob	73999	Brightness and Vert. Hold (Tan for Maple Instruments)
	Knob	76174	TV-Phono (Maroon for Mahogany or Walnut Instruments)
	Knob	76175	TV-Phono (Beige for Oak Instruments)
	Knob	74963	Contrast, Horiz. Hold and Off/On Volume (Maroon for Mahogany or Walnut Instruments)
		75464	Contrast, Horiz. Hold Off/On Volume (Beige for Oak Instruments)
	Knob	74001	Contrast, Horiz. Hold Off/On Volume (Tan for Maple Instruments)

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA							REMARKS
	RCA VICTOR PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M2	75575	CAC-J or AC-J	Q-33 A-1	W31AR	A53MG	34	O-1 or S-1	

ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Disconnect built-in antenna.
3. Remove four screws from rear cover. Remove rear cover.
4. Disconnect phonograph audio jack.
5. Disconnect phonograph power plug.
6. Disconnect speaker.
7. Disconnect picture tube socket.
8. Disconnect picture tube ground.
9. Disconnect high voltage lead.
10. Disconnect yoke cable.
11. Remove jewel light.
12. Remove four 7/16" hex head bolts from chassis. Remove chassis.
13. Remove four square machine nuts from speaker. Remove speaker.

NOTE:-FOR PICTURE TUBE REMOVAL, IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED ABOVE.

PHOTOFACT* Folder

REGAL MODELS 17T22, 20C22, 20D22, 20T22, 22D17, 22D19, 1708, 2217, 2219

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MODEL 17T22

REGAL MODELS 17T22, 20C22, 20D22, 20T22, 22D17, 22D19, 1708, 2217, 2219

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DATE 9-51 SET 143 FOLDER 13

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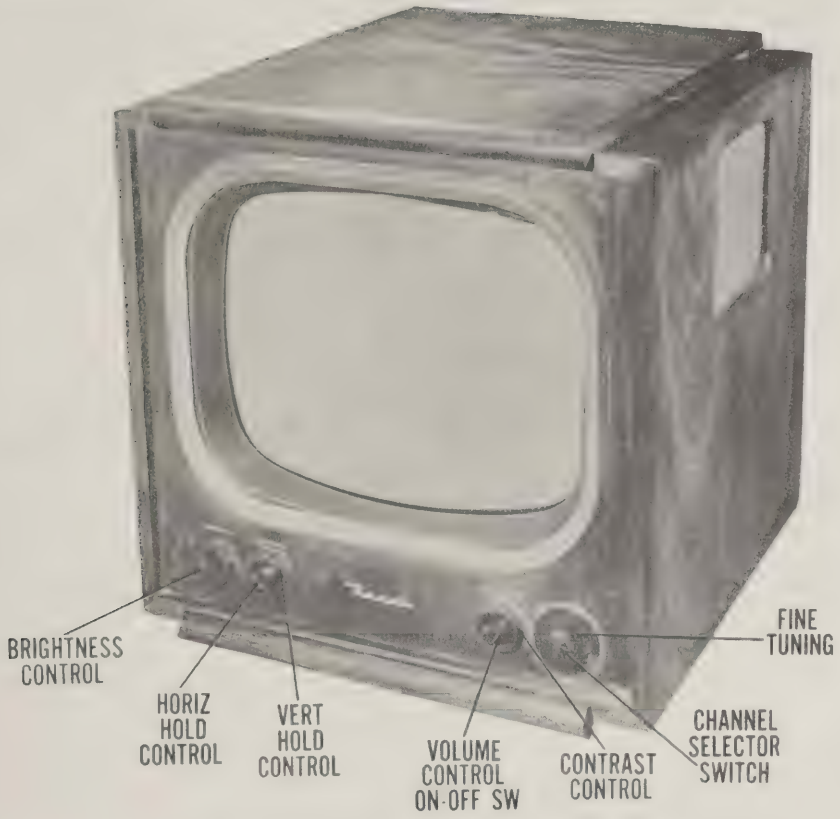

REGAL MODEL 17T22

TRADE NAME	Regal	CHASSIS	MODEL
		2022 (Code 77 or 88)	20C22, DX, 20D22, DX, 20T22, DX.
		2217 (Code 77 or 88)	17T22, DX, 22D17, DX, 1708, DX, 2217, DX
		2219 (Code 77 or 88)	22D19, DX, 2219, DX.
MANUFACTURER	Regal Electronics Corp., 603 W. 130th. St., New York (27), N. Y.		
TYPE SET	Television Receiver		
POWER SUPPLY	110-120 Volts AC-60 Cycle		
RATING	1.7 Amp. at 117 Volts AC		
TUNING RANGE	Channels 2 thru 13		

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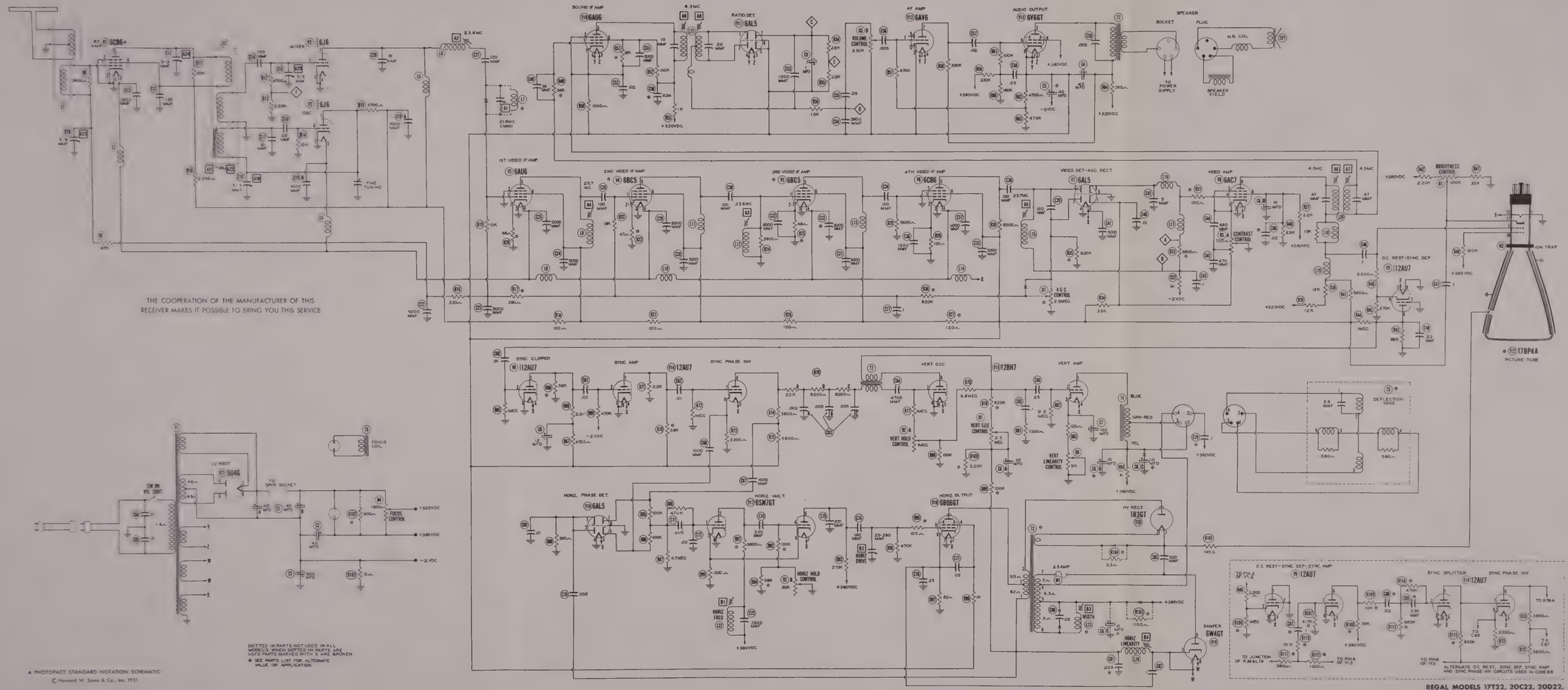
REGAL MODELS 17T22, 20C22, 20D22, 20T22, 22D17, 22D19, 1708, 2217, 2219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REGAL MODELS 17T22, 20C22, 20D22, 20T22, 22D17, 22D19, 1708, 2217, 2219

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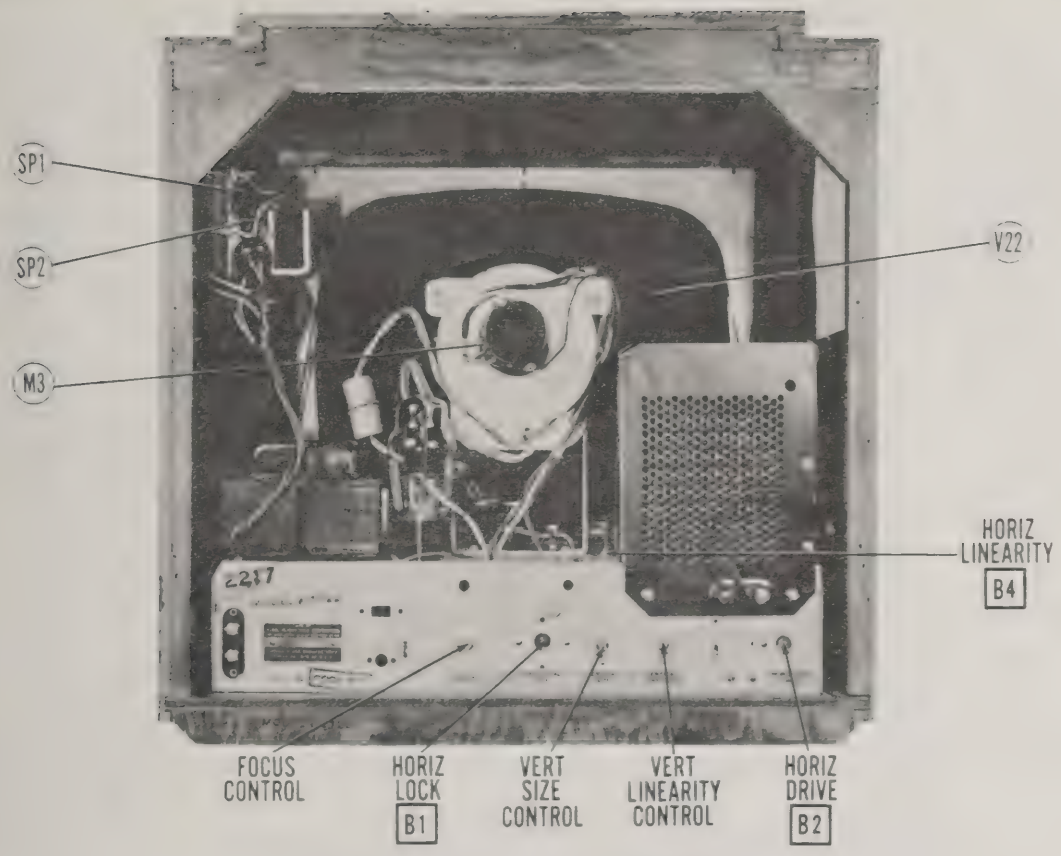


CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug, (B1), until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter-clockwise as far as possible without crowding or beaded vertical lines appearing in the picture.

If the set has a width slug, (B3), adjust it until the picture is slightly wider than necessary to fill the mask.

Adjust the horizontal linearity slug, (B4), until the picture is symmetrical from left to right. Slight readjustment of B2 may be necessary for optimum results.

DISASSEMBLY INSTRUCTIONS

1. Remove eight push-on type control knobs.
2. Remove seven wood screws from rear cover. Remove rear cover.
3. Disconnect built-in antenna.
4. Disconnect speaker.
5. Remove four metal screws from chassis. Remove chassis.
6. Remove four 5/16" hex nuts from speaker. Remove speaker.

NOTE: - FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE THE CHASSIS AS OUTLINED.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	6CB6	6CB6	6CK	
B	RF Amplifier	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BD	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4A	2nd Video IF Amp.	6BC5	6BC5	7BD	
B	2nd Video IF Amp.	6AG5	6AG5	7BD	
C	2nd Video IF Amp	6AU6	6AU6	7BK	
D	2nd Video IF Amp	6CB6	6CB6	6CK	Used in models with "DX" series only
V5A	3rd. Video IF Amp	6BC5	6BC5	7BD	
B	3rd Video IF Amp.	6AG5	6AG5	7BD	
C	3rd. Video IF Amp	6AU6	6AU6	7BK	
D	3rd. Video IF Amp	6CB6	6CB6	6CK	Used in models with "DX" series only.
V6	4th Video IF Amp.	6CB6	6CB6	6CK	
V7	Video Detector - AGC Rectifier	6AL5	6AL5	6BK	
V8	Video Amplifier	6AC7	6AC7	8N	
V9	DC Restorer-Sync. Separater-Sync. Clipper	12AU7	12AU7	9A	
V10	Sound IF Amp.	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier	6AV6	6AV6	7BT	
V13	Audio Output	6V6GT	6V6GT	7AC	
V14	Sync. Amplifier Sync. Phase Inv.	12AU7	12AU7	9A	
V15	Vert. Oscillator-Vert. Amplifier	12BH7	12BH7	9A	
V16	Horiz. Phase Det.	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: REGAL PART No	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: THOMAS PART No.	RTMA BASE TYPE	NOTES
V22A	17BP4A	17BP4	17BP4		Ⓒ Glass Equivalent tube. Ground outer coating and change high voltage capacitor.
B	19AP4A	19BP4A Ⓒ	19BP4A Ⓒ		
C	20CP4A	20CP4A	20CP4A		

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1 A	40	500	60-8	AFH2-72		UP4450		TVL-2830	▲ Filter
B	40	500							▲ Filter
C2	40	400	60-12	PRS450/40		BR4045A		TVA-1712	Filter
C3	500	5	60-10	PRS6/500		BRB605A		TVA-1103	Bias Filter
C4	40	400	60-15	PRS450/40		BR4045A		TVA-1712	Audio Output Decoupling
C5	40	400	60-12	PRS450/40		BR4045A		TVA-1712	Audio Output Cathode †
C6 A	20	450		AFH4-13		UPT2U1145		TVL-4766	▲ Vert. Osc. Dec. ▲ Vert. Amp. Dec. †
B	10	450							▲ Vert. Amp. Dec. †
C	10	450							Video Amp. Screen
D	10	450							Damper Filter ††
C7	100	25	60-9	PRS25/100		BRB251A		TVA-1207	Vert. Amp. Cathode
C8	12	200	60-19	PRS250/12		BR1225A		TVA-1505	Sync. Sep. Decoupling
C9	1	50	60-7	PRS150/4		BBR2-50T		TVA-1300	Stabilizing Cap.
C10	3-9			829-3					Variable Trimmer
C11	5-3			829-3					Variable Trimmer
C12	120			SU120	D6-121		GP2K-121	5GA-T12	RF Amp. Decoupling
C13	1000			SU1000	D6-102		GP2L-102	5HK-D1	RF Amp. Fil.
C14	100			SU100N750	TCN-100		N750L-101	5TCU-T1	RF Coupling
C15	5-3				829-3				Variable Trimmer
C16	20			SU20NP0	TCZ-20		NP0K-200		Osc. Grid Cap.
C17	10			SU10N750	TCZ-10		N750K-100	5TCU-Q1	Fixed Trimmer
C18	5-3				829-3				Variable Trimmer
C19 A	1000		BPD-2X001	DD-2-102		812-001		5HK-2D1	RF Bypass
B	1000								Conv. Fil.
C20	10			SU10NP0	TCZ-10		NP0K-100	5TCC-Q1	Fixed Trimmer
C21	120				TCN-120		N750L-121		IF Coupling
C22	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C23	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	AGC Filter
C24	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st. Video IF Dec.
C25	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	1st. Video IF Fil.
C26	100			SU100	D6-101	5WST1	GP1K-101	5GA-T1	IF Coupling
C27	1			P488-1	DF-104	PTE4P1		4TM-P1	AGC Filter
C28	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd. Video IF Dec.
C29	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	2nd. Video IF Fil.
C30	100			SU100N750	TCN-100		N750L-101	5TCU-T1	IF Coupling
C31	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Dec.
C32	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	3rd. Video IF Cathode
C33	5000			BPD-005	DD-502	1D5D5	811-005	5HC-D5	3rd. Video IF Fil. *
C34	100			SU100N750	TCN-100		N750L-101	5TCU-T1	IF Coupling
C35	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th. Video IF Screen
C36	1500			SU1500	D6-152	1W5D15	GP2L-152	5HK-D15	4th. Video IF Cathode
C37	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	4th. Video IF Fil.
C38	100			SU100	D6-101	5WST1	GP1K-101	5GA-T1	IF Coupling
C39	120	500		1469-00015	D6-121	5RST15	GP2K-121	5GA-T12	IF Coupling
C40	01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	RF Bypass
C41	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Video Det. Fil.
C42	5	500		1469-000005		SR5Y5	NP0K-050	MS-55	Video Det. Filter
C43	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	RF Bypass
C44	680	500		1479-0007	D6-681	2R5T7	GP2K-681	MS-34	Video Amp. Cathode
C45	470	500		1469-0005	D6-471	5RST5	GP2K-471	MS-35	Contrast Cont. Shunt
C46	.1	600		P488-1	DF-104	PTE6P1		6TM-P1	Video Coupling
C47	.1	400		P488-1	DF-104	PTE4P1		4TM-P1	Picture Tube Cathode
C48	22	500		1469-000025	D6-220	SR5Q25	GP1K-220	MS-425	DC Restorer Plate
C49	39			SU39	D6-390	5W5Q4	GP1K-390		Sound IF Coupling
C50	024	1800		P1688-02		PTE1882		MB-S2	RF Bypass ¶
C51	5000			BPD-005	DD-502	1D5D5	811-005	5HK-D5	Sound IF Screen

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C52	02	600		P688-02	DF-203	PTE6S2		6TM-S2	Sound IF Cathode
C53	1000	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Diode Load Cap.
C54	3900	500		1464-004	D6-402	1DR5D4	GP2-333-402	MS-24	De-emphasis
C55	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C56	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Coupling
C57	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Audio Coupling
C58	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Bias Filter
C59	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Audio Output Plate
C60	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Sync. Coupling
C61	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C62	01	600		P688-01	D6-103	PTE6S1	GP2-333-103	6TM-S1	Sync. Coupling
C63 A	.002			P688-002		PTE6D2	GP2-333-202		Integrator Net.
B	.005			P688-005	♦ PC-100	PTE6D5	GP2-333-502	♦ 10iC1	Integrator Net.
C	.005			P688-005		PTE6D5	GP2-333-502		Integrator Net.
C64	4700	500		1464-005	D6-472	1DR5D5	GP2-333-472	MS-25	Vert. Sync. Coupling
C65	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Vert. Discharge
C66	.25	600		684-25		GP6P25		6TM-P25	Vert. Sweep Coupling
C67	1000	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Horiz. Sync. Coupling
C68	1000	500		1468-001	D6-.02	1W5D1	GP2L-102	1FM-21	Horiz. Sync. Coupling
C69	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AFC Filter
C70	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	Horiz. Feedback
C71	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	6TM-D5	AFC Filter
C72	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Horiz. MV Grid
C73	3900	500		1464-004		1DR5D4		MS-24	Fixed Trimmer
C74	330	500		1469-00035					Horiz. MV Feedback
C75	270	1000							Horiz. Discharge
C76	180	500		1469-0002		5R5T2		MS-32	Horiz. Sweep Coupling
C77	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Horiz. Output Screen
C78	.25	600		684-25		GP6P25		6TM-P25	Horiz. Output Cathode
C79	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Horiz. Sweep Coupling ††
C80	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Fixed Trimmer
C81	.039	1000							Damper Filter ††
C82	.1	1000		1684-1					Damper Filter
C83	500	20000		HV20C	TV3-502				HV Filter
C84	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Line Filter
C85	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Line Filter
C86	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Video Amp. Screen *
C87	.1	600		P688-1	DF-104	PTE6P1		6TM-P1	Sync. Coupling **
C88	.02	600		P688-02	DF-203	PTE6S2		6TM-S2	Sync. Coupling **
C89	330	500		1469-00035	D6-331			1FM-335	Sync. Coupling **

* Not used in all models.
† Some models use 50 MFD at 200V in this application (Mfgr. Part # 60-121)
‡ Some models Parallel C6B, and C6C, other use C6C as Damper Decoupling.
¶ Some models use .02MFD in this application.
†† Some models use .25MFD in this application.
‡‡ Some models use .035MFD in this application.
♦ Items C63A, C63B, C63C, R76A, R76B, R76C are combined in one unit.
** Used in model code #68 only.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: CENTRALAB PART No.	INSTALLATION NOTES
R1A	100KΩ	½	T-20-10	Q11-128	AM-49-S	B-40	Brightness Control
B	Shaft		Not req.	Not req. (Concentrikit)	FS-3	Not req.	Attach to R1A per instructions
R2A	1Meg	½	T-20-2	B11-137 ♂	RTV-2		Vert. Hold Control - Front
B	50KΩ	½		B11-123 ♂			Horiz. Hold Control - Rear
C	Shaft end			E-187 ♂			Attach per instructions in Concentrikit
R3A	750Ω	2	T-20-9				Contrast Control - Wire Wound - Front
B	250KΩ	½			RTV-192		Volume Control and SW - Rear
R4	1500Ω	4	T-20-8		RTV-6	SVP-994	Focus Control - Wire Wound
R5A	2.5Meg	½	T-20-5	Q11-239	AM-84-S	AN-83	Vert. Size Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R5A per instructions
R6A	5000Ω	½	T-20-6	Q11-114	AM-19-S	AN-10	Vert. Linearity Control
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	2.5Meg	½	T-20-5	Q11-239	AM-84-S	AN-83	AGC Control - See Note 1
B	Shaft		Not req.	Not req.	FKS-1/4	AK-1	Attach to R7A per instructions

♂ Additional parts to be used with Concentrikit.
Note 1 Not used in all models.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
					ALL RESISTORS ± 10% UNLESS OTHERWISE SPECIFIED
R8	3900Ω	1		BTS-3900	Antenna Coil Shunt
R9	47KΩ 20%	1		BTS-47K	AGC Network
R10	2200Ω 20%	1		BTS-2200	RF Amp. Decoupling
R11	10KΩ 20%	1		BTS-10K	RF Coil Shunt
R12	4700Ω	1		BTS-4700	Mixer Grid
R13	220KΩ 20%	1		BTS-220K	Mixer Grid
R14	10KΩ	1		BTS-10K	Osc. Grid
R15	4700Ω	1		BTS-4700	Osc. Plate
R16	330Ω	1		BTS-330	AGC Network
R17	390Ω	1			AGC Network - See Note 3
R18	100Ω	1		BTS-100	Decoupling
R19	10KΩ 20%	1			1st. Video IF Amp. Grid
R20	68Ω	1			1st. Video IF Amp. Cathode - See Note 4
R21	100Ω	1		BTS-100	Decoupling
R22	18KΩ	1		BTS-18K	2nd. Video IF Amp. Grid
R23	47Ω	1			2nd. Video IF Amp. Cathode - See Note 4
R24	3900Ω	1		BTA-3900	3rd. Video IF Transformer Shunt
R25	[redacted]	1			3rd. Video IF Amp. Cathode - See Note 4
R26	100Ω	1		BTS-100	Decoupling
R27	120Ω	1		BTS-120	Decoupling - See Note 5
R28	5600Ω	1			4th. Video IF Amp. Grid
R29	150Ω 20%	1		BTS-150	4th. Video IF Amp. Cathode - See Note 6
R30	8200Ω 20%	1			4th. Video IF Amp. Plate
R31	100Ω	1		BTS-100	Parasitic Suppressor - See Note 7
R32	1000Ω	1		BTS-1000	Bias Network
R33	6800Ω	1		BTS-6800	Video Det. Diode Load - See Note 8
R34	39KΩ	1		BTA-39K	Voltage Divider
R35	820KΩ	½		BTS-820K	AGC Network - See Note 9
R36	820KΩ	½		BTS-820K	AGC Network - See Note 9
R37	22KΩ	5			Video Amp. Screen - Wire Wound
R38	15KΩ	2		BTB-15K	Video Amp. Plate
R39	12KΩ	2		BTB-12K	Video Amp. Plate
R40	22KΩ	2		BTB-22K	Voltage Divider

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R41	5600Ω	1		BTA-5600	Voltage Divider
R42	220KΩ	½		BTS-220K	Voltage Divider
R43	68KΩ 20%	½		BTS-68K	Voltage Divider
R44	1Meg	½		BTS-1Meg	Isolation
R45	270KΩ	½		BTS-270K	DC Restorer Diode Load
R46	2200Ω 20%	½		BTS-2200	Picture Tube Grid
R47	33KΩ	½		BTS-33K	Picture Tube Cathode
R48	100KΩ 20%	½		BTS-100K	Acc. Anode Load
R49	56KΩ	½		BTS-56K	Sound IF Amp. Grid - See Note 10
R50	1000Ω	½		BTS-1000	Bias Network
R51	18KΩ	½		BTS-18K	Voltage Divider - See Note 11
R52	100KΩ 20%	½		BTS-100K	Sound IF Amp. Screen
R53	1000Ω	½		BTS-1000	Sound IF Amp. Decoupling
R54	22KΩ	½		BTS-22K	Ratio Det. Diode Load
R55	22KΩ	½		BTS-22K	Ratio Det. Diode Load
R56	15KΩ	½		BTS-15K	De-emphasis
R57	470KΩ	½		BTS-470K	AF Amp. Grid
R58	330KΩ	½		BTS-330K	AF Amp. Plate
R59	330KΩ	½		BTS-330K	Bias Network
R60	180KΩ 5%	½		BTS-180K-5%	Bias Network
R61	100KΩ 20%	½		BTS-100K	Output Grid
R62	4700Ω	1		BTA-4700	Bias Network
R63	470KΩ	½		BTS-470K	AF Amp. Grid
R64	390Ω	1		BTA-390	Decoupling
R65	1Meg	½		BTS-1Meg	Sync. Sep. Grid
R66	22KΩ	½		BTS-22K	Sync. Sep. Plate
R67	4700Ω	1		BTA-4700	Sync. Sep. Decoupling
R68	56KΩ	1		BTA-56K	Voltage Divider - See Note 10
R69	470KΩ	½		BTS-470K	Sync. Amp. Grid
R70	56KΩ	1		BTA-56K	Sync. Amp. Plate - See Note 10
R71	22KΩ	½		BTS-22K	Voltage Divider
R72	1Meg	½		BTS-1Meg	Sync. Phase Inv. Grid
R73	3300Ω 20%	½		BTS-3300	Sync. Phase Inv. Cathode
R74	3900Ω	1		BTA-3900	Sync. Phase Inv. Plate
R75	5600Ω	1		BTS-5600	Sync. Phase Inv. Plate
R76A	22KΩ	½		BTS-22K	Integrator
B	8200Ω	½		BTS-8200	Integrator
C	8200Ω	½		BTS-8200	Integrator
R77	1Meg	½		BTS-1Meg	Vert. Osc. Grid
R78	820KΩ	½		BTS-820K	Vert. Osc. Plate - See Note 12
R79	6.8Meg 20%	½		BTS-6.8Meg	Voltage Divider
R80	100KΩ 20%	½		BTS-100K	Voltage Divider
R81	3300Ω	½		BTS-3300	Vert. Peaking
R82	2.2Meg	½		BTS-2.2Meg	Vert. Amp. Grid
R83	120Ω	1		BTS-120	Vert. Amp. Cathode
R84	1000Ω 20%	1		BTA-1000	Vert. Amp. Decoupling
R85	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R86	100KΩ	½		BTS-100K	Horiz. Phase Det. Diode Load
R87	4.7Meg 20%	½		BTS-4.7Meg	Horiz. Phase Det. Diode Load
R88	390Ω	½		BTS-390	Horiz. Feedback Network
R89	470KΩ	½		BTS-470K	Horiz. AFC Filter
R90	1500Ω 20%	½		BTS-1500	Horiz. MV Cathode
R91	5600Ω	½		BTS-5600	Horiz. MV Plate - See Note 13
R92	150KΩ	½		BTS-150K	Horiz. MV Grid - See Note 14
R93	270KΩ	½		BTS-270K	Horiz. MV Plate
R94	56KΩ	1		BTA-56K	Horiz. Hold Control Shunt - See Note 10
R95	100Ω	½		BTS-100	Parasitic Suppressor - See Note 7
R96	470KΩ	½		BTS-470K	Horiz. Output Grid
R97	82Ω	2		BW-2-82	Horiz. Output Cathode
R98	1000Ω	½		BTS-1000	Horiz. Output Screen
R99	100KΩ 20%	1		BTA-100K	Vert. Osc. Decoupling - See Note 15
R100	220KΩ 5%	2		BTB-220K	Voltage Divider - See Note 16
R101	1Meg	2			HV Filter
R102	600Ω	2			Focus Coil Shunt - See Note 2
R103	12Ω	1		BW-1-12	Bias Network - Wire Wound
R104	3.3Ω	½			HV Rectifier Filament - See Note 2
R105	1100Ω	10		1 3/4A-1100	Damper Decoupling - Wire Wound - See Note 2
R106	1Meg	½		BTS-1Meg	DC Rest. Diode Load - See Note 17
R107	470KΩ	½		BTS-470K	Sync. Amp. Grid - See Note 17
R108	39KΩ	2		BTB-39K	Sync. Amp. Plate - See Note 17
R109	10KΩ	½		BTS-10K	Voltage Divider - See Note 17
R110	10KΩ	½		BTS-10K	Isolation - See Note 17
R111	3900Ω	1		BTA-3900	Voltage Divider - See Note 17
R112	1500Ω	½		BTS-1500	Voltage Divider - See Note 17
R113	680KΩ	½		BTS-680K	Integrator - See Note 17
R114	470KΩ	½		BTS-470K	Sync. Sep. Grid - See Note 17
R115	820KΩ	½		BTS-820K	Sync. Sep. Plate - See Note 17

♦ Items R76A, R76B, R76C, C63A, C63B, and C63C are combined into one unit.
Note 2 Not used in all models.
Note 3 Some models use 330Ω resistor in this application.
Note 4 Some models use 82Ω or 56Ω resistor in this application.
Note 5 Some models use 100Ω resistor in this application.
Note 6 Some models use 180Ω resistor in this application.
Note 7 Some models use 120Ω resistor in this application.
Note 8 Some models use 8200Ω resistor in this application.
Note 9 Some models use 680KΩ resistor in this application.
Note 10 Some models use 47KΩ resistor in this application.
Note 11 Some models use 15KΩ resistor in this application.
Note 12 Some models use 910KΩ resistor in this application.
Note 13 Some models use 3900Ω resistor in this application.
Note 14 Some models use 180KΩ resistor in this application.
Note 15 Some models use 22KΩ resistor in this application.
Note 16 Some models use 100KΩ resistor in this application.
Note 17 Used in models coded # 88 only.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC Ⓐ 1.7A	760VCT .200ADC	5VAC Ⓐ 3A	6.3VAC Ⓐ 1.2A SEC. 4 6.3VAC Ⓐ 1.35A SEC. 5 6.3VAC Ⓐ 6.2A	140-12		P-3066	

REGAL MODELS 17T22, 20C22, 20D22, 20T22, 22D17, 22D19, 1708, 2217, 2219

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA REGAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	140Ω	800Ω	140-8	A-8122 ①	A-3000 ①	TB0-1 ①	Vert. Block Osc. Trans.
T3	375Ω	10Ω	140-21 ②		HV0-7		Horiz. Output Trans.
	Tap 62Ω	Taps .5 and 7Ω					
		SEC. 2 0Ω					
T3	380Ω	24Ω	140-26 ③		HV0-7		Horiz. Output Trans.
	Tap 38Ω	Taps .4 and 12.6Ω					
		SEC. 2 0Ω					
T4	570Ω	6.9Ω	140-9	A-8115	A-3035	TS0-1	Vert. Output
T5A	19.5Ω		140-122 ④	DY-7	MDF-70		Horiz. Deflection Coil
B	48Ω						Vert. Deflection Coil
T5A	17Ω		30-52 ⑤	DY-7	MDF-70		Horiz. Deflection Coil
B	67Ω						Vert. Deflection Coil
T6	470Ω		140-20	FC-11	MF-2		Focus Coil

① Drill one new mounting hole.
② Used in chassis 2217 and 2219.
③ Used in chassis 2022.
④ Used in chassis 2217.
⑤ Used in chassis 2219 and 2022.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA REGAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	4.1KΩ	3.1Ω	310Ω	.5Ω	140-13	A-3825	A-2930	RO-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA REGAL PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	90Ω	3.1Ω	T110-2		46A90S	
	CONE DIA.	V. C. DIA.				
SP2	4"X6"	9/16"				

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA REGAL PART No.	MEISSNER PART No.	NOTES
L1	Ant. Coils	0Ω	0Ω			Part of Tuner Part # TV-201
L2	Fil. Choke	0Ω				Part of Tuner Part # TV-201
L3	RF, Mixer Grid and Osc. Coils	0Ω				Part of Tuner Part # TV-201
L4	Fil. Choke	0Ω				Part of Tuner Part # TV-201
L5	Conv. Plate Coil	0Ω				Part of Tuner Part # TV-201
L6	1st. Video IF	1.2Ω				Part of Tuner Part # TV-201
L7	Sound Trap	0Ω				Used in Models 20C22, 20D22, 20T22 only
L8	Fil. Choke	0Ω		30-11		
L9	2nd. Video IF	.3Ω		30-48A		
L10	Fil. Choke	0Ω		30-11		
L11	RF Choke	3.6		30-24		
L12	3rd. Video IF	.3Ω		30-48A		
L13	RF Choke	3.6		30-24		
L14	Fil. Choke	0Ω		30-11		
L15	5th. Video IF	.3Ω		30-49		
L16	Peaking	6.5Ω		30-54	19-1921	180 Microhenries (Orange Dot)
L17	Peaking	14Ω		30-28		600 Microhenries (Gray Dot)
L18	Peaking	6Ω		T30-35	19-1921 †	160 Microhenries wound on 15KΩ resistor
L19	Peaking	10Ω		30-30	19-1923	380 Microhenries (Purple Dot)
L20	Sound IF	2Ω	2Ω	30-46		
L21	Ratio Det. Trans.	4.6Ω	2.2Ω	30-47		Tap 2Ω
L22	Horiz. Osc.	80Ω		T30-26		
L23	Horiz. Size	.6Ω		30-17		Not used in Models 17T22, 22D17, 1708 and 2217
L24	Horiz. Lin	31Ω		30-16		

† Parallel with 15KΩ resistor.

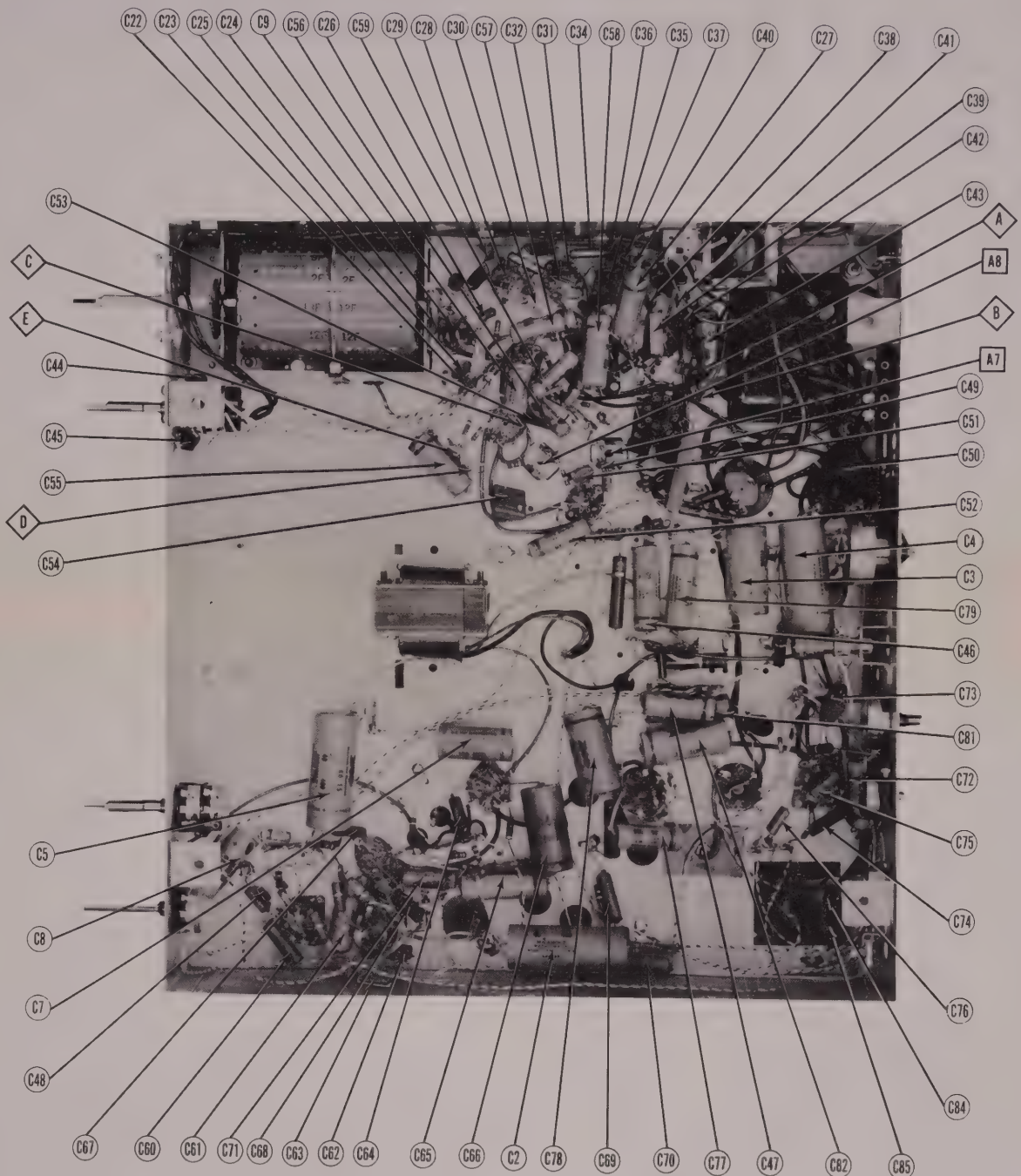
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA REGAL PART No. FUSE	REGAL PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	REMARKS
M1	3AG Pigtail	.250				318.250	

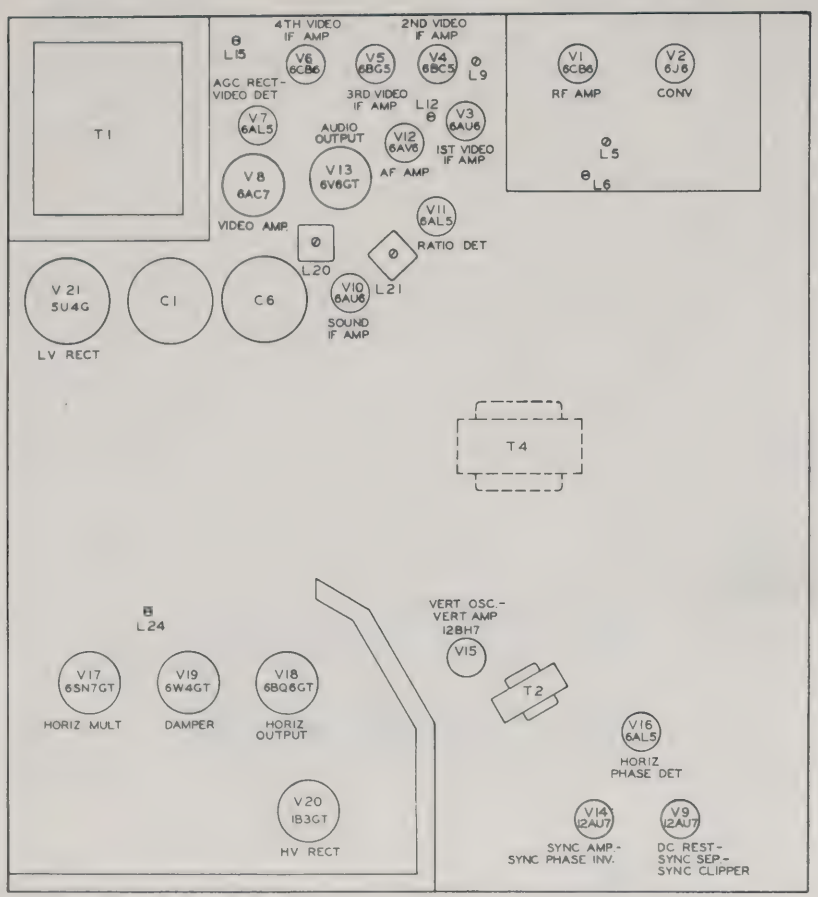
MISCELLANEOUS

ITEM No.	PART NAME	REGAL PART No.	NOTES
M2	RF Tuner	TV-201	
M3	Ion Trap	150-154	
B2	Trimmer	T-40-1	25-280MMF(Horiz. Drive)

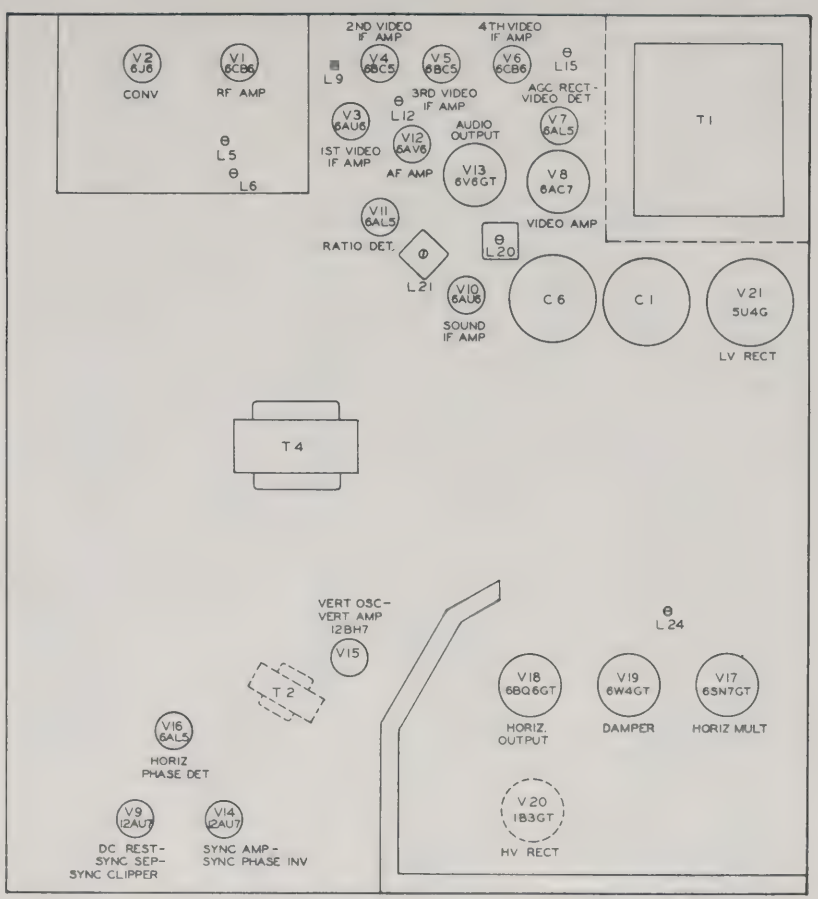
CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW- CAPACITOR AND ALIGNMENT IDENTIFICATION



TOP VIEW



BOTTOM VIEW

TUBE PLACEMENT CHART

REGAL MODELS 17T22, 20C22, 20D22, 20T22, 22D17, 22D19, 17O8, 22I7, 22I9

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, (V2), and replace it with a 6J6 which has pin 1 removed, this will disable the local oscillator and prevent the possibility of erroneous indications.
Connect the negative lead of a three volt battery to the ungrounded lead of C27. Connect the positive lead to chassis.
The trap A1 appears in models, 20C22, 20D22, and 20T22 only.
When aligning all other models omit step 1.
During video IF alignment the common lead of the VTVM is connected to approximately 2 volts with respect to chassis. Avoid grounding the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	21.9MC	Any	DC Probe to point (A). Common to point (B).	A1	Adjust for MINUMUM deflection.
2.	"	"	23.6MC	"	"	A2, A3	Adjust for maximum deflection.
3.	"	"	25.7MC	"	"	A4, A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	24MC (10MCSWP)	21.9MC 26.4MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A2 thru A5 for proper response. If set has sound trap adjust A1 to properly place 21.9MC marker.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to approximately 140 volts with respect to chassis. Avoid grounding or touching the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	.01Mfd.	High side to pin 4 (grid) of 6AC7, (V8). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to point (C). Common to chassis.	A6, A7, A8	Adjust for maximum deflection.
6.	"	"	"	"	DC Probe to point (D). Common to point (E).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD.	High side to pin 4 (Grid) of 6AC7, (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (C). Low side to chassis.	A6, A7, A8	Disconnect stabilizer capacitor C9. Adjust for maximum amplitude and symmetry as per fig. 2.
6.	"	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A9	Reconnect capacitor C9. Adjust A9 so 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube, and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off-frequency approximately the same for a majority of the channels it may be possible to correct them in one step using A10. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A10 will not bring all channels well within the range of the fine tuning control, it will be necessary to adjust the channel strip adjustments for each channel that is off-frequency. The channel strip adjustments are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MCSWP)	211.25MC 215.75MC	13	Vert. Amp. to point A. Low side to chassis.	A11	Adjust to place video marker at 50% as shown in fig. 4.
			207MC (10MCSWP)	205.25MC 209.75MC	12		A12	
			201MC (10MCSWP)	199.25MC 203.75MC	11		A13	
			195MC (10MCSWP)	193.25MC 197.75MC	10		A14	
			189MC (10MCSWP)	187.25MC 191.75MC	9		A15	
			183MC (10MCSWP)	181.25MC 185.75MC	8		A16	
			177MC (10MCSWP)	175.25MC 179.75MC	7		A17	
			85MC (10MCSWP)	83.25MC 87.75MC	6		A18	
			79MC (10MCSWP)	77.25MC 81.75MC	5		A19	
			69MC (10MCSWP)	67.25MC 71.75MC	4		A20	
			63MC (10MCSWP)	61.25MC 65.75MC	3		A21	
			57MC (10MCSWP)	55.25MC 59.75MC	2		A22	

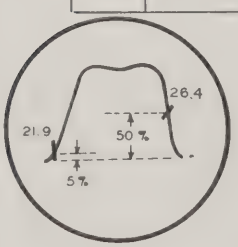


FIG. 1

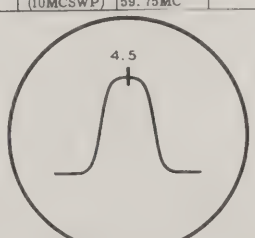


FIG. 2

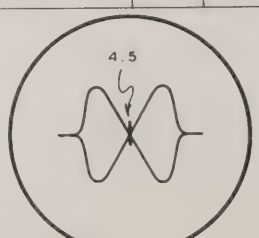


FIG. 3

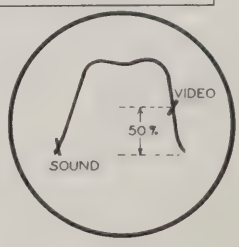


FIG. 4

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Leave the bias connected as during video IF alignment, but reduce the voltage to 1.5.
The sweep generator output lead should be terminated with its characteristic impedance usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MCSWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point (F). Low side to chassis.	A23, A24, A25	Adjust for response curve similar to fig. 5 with markers above 90%.
9.	"	"	213MC (10MCSWP)	211.25MC 215.75MC	13	"		Check all channels for response similar to fig. 5. If markers fall below 70% on any channel, make slight adjustment of A23, A24 and A25 with channel switch set for that channel. Recheck all channels.to see that they have not been seriously effected.
			201MC (10MCSWP)	199.25MC 203.75MC	11			
			195MC (10MCSWP)	193.25MC 197.75MC	10			
			189MC (10MCSWP)	187.25MC 191.75MC	9			
			183MC (10MCSWP)	181.25MC 185.75MC	8			
			177MC (10MCSWP)	175.25MC 179.75MC	7			
			85MC (10MCSWP)	83.25MC 87.75MC	6			
			79MC (10MCSWP)	77.25MC 81.75MC	5			
			69MC (10MCSWP)	67.25MC 71.75MC	4			
			63MC (10MCSWP)	61.25MC 65.75MC	3			
			57MC (10MCSWP)	55.25MC 59.75MC	2			

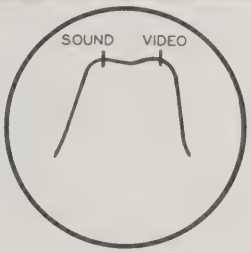


FIG. 5

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-.4VDC	0V	6.3VAC	0V	85VDC	85VDC	0V		
V 2	6J6	80VDC	105VDC	6.3VAC	0V	-.4VDC	§-2.7VDC	0V		
V 3	6AU6	-1.1VDC	0V	0V	6.3VAC	105VDC	105VDC	.2VDC		
V 4	6BC5	-.4VDC	0V	0V	6.3VAC	110VDC	110VDC	.3VDC		
V 5	6BC5	0V	0V	0V	6.3VAC	115VDC	115VDC	.8VDC		
V 6	6CB6	0V	1.8VDC	0V	6.3VAC	55VDC	120VDC	0V		
V 7	6AL5	0V	-2VDC	6.3VAC	0V	-1.6VDC	0V	-.4VDC		
V 8	6AC7	0V	0V	1.8VDC	-1.6VDC	1.8VDC	150VDC	6.3VAC	145VDC	
V 9	12AU7	43VDC	-.4VDC	0V	6.3VAC	6.3VAC	6VDC	0V	1.5VDC	0V
V 10	6AU6	▲1.6VDC	▲2.5VDC	▲6.3VAC	▲0V	▲190VDC	▲27VDC	▲2.5VDC		
V 11	6AL5	▲-.3VDC	▲-.3VDC	▲6.3VAC	▲0V	▲0V	▲0V	▲-.7VDC		
V 12	6AV6	▲-.6VDC	▲0V	▲0V	▲6.3VAC	▲-.3VDC	▲-.3VDC	▲95VDC		
V 13	6V6GT	▲-120VDC	▲0V	▲140VDC	▲200VDC	▲-2.6VDC	▲-2.9VDC	▲6.3VAC	▲0V	
V 14	12AU7	32VDC	-4.4VDC	0V	6.3VAC	6.3VAC	100VDC	0V	5.8VDC	0V
V 15	12BH7	375VDC	§.4VDC	5VDC 24VDC	6.3VAC	6.3VAC	65VDC 155VDC	§-48VDC	0V	0V
V 16	6AL5	0V	0V	6.3VAC	0V	2.6VDC	0V	-3.9VDC		
V 17	6SN7GT	§-1VDC	280VDC	10.6VDC	§-11.5VDC	140VDC	10.6VDC	6.3VAC	0V	
V 18	6BQ6GT	0V	6.3VAC	-7.2VDC	100VDC	-7.2VDC	120VDC	0V	5.1VDC	Top Cap *
V 19	6W4GT	0V	0V	600VDC	0V	320VDC	0V	600VDC	600VDC	
V 20	1B3GT	*	DO NOT MEASURE							Top Cap *
V 21	5U4G	0V	400VDC	320VDC	360VAC	120VDC	360VAC	340VDC	400VDC	
V 22	17BP4A	0V	1.5VDC	Pin 10 320VDC	Pin 11 125VDC	Pin 12 6.3VAC	H. V. CONNECTOR ** 10.2KV.			

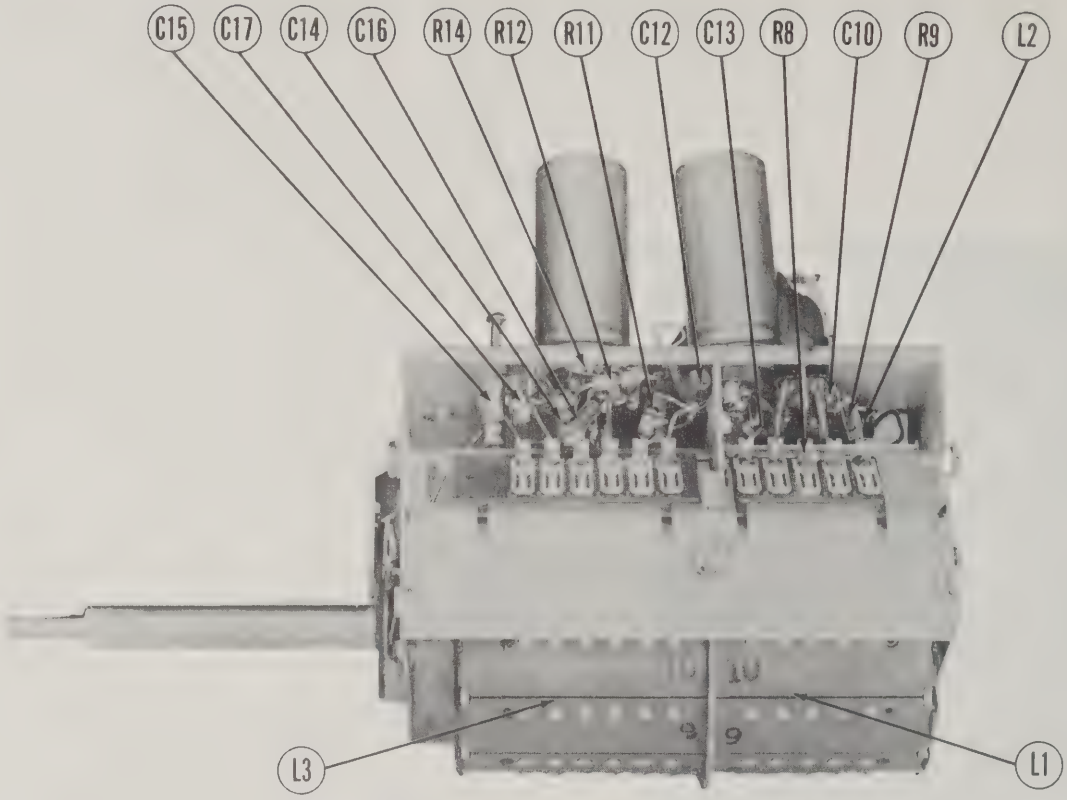
ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
▲ MEASURED FROM PIN 8 OF V13.
* DO NOT MEASURE.
§ TAKEN WITH VACUUM TUBE VOLTMETER.
** USE EXTREME CAUTION WHEN MEASURING THIS VOLTAGE
FOCUS CONTROL FULLY COUNTER-CLOCKWISE

RESISTANCE READINGS

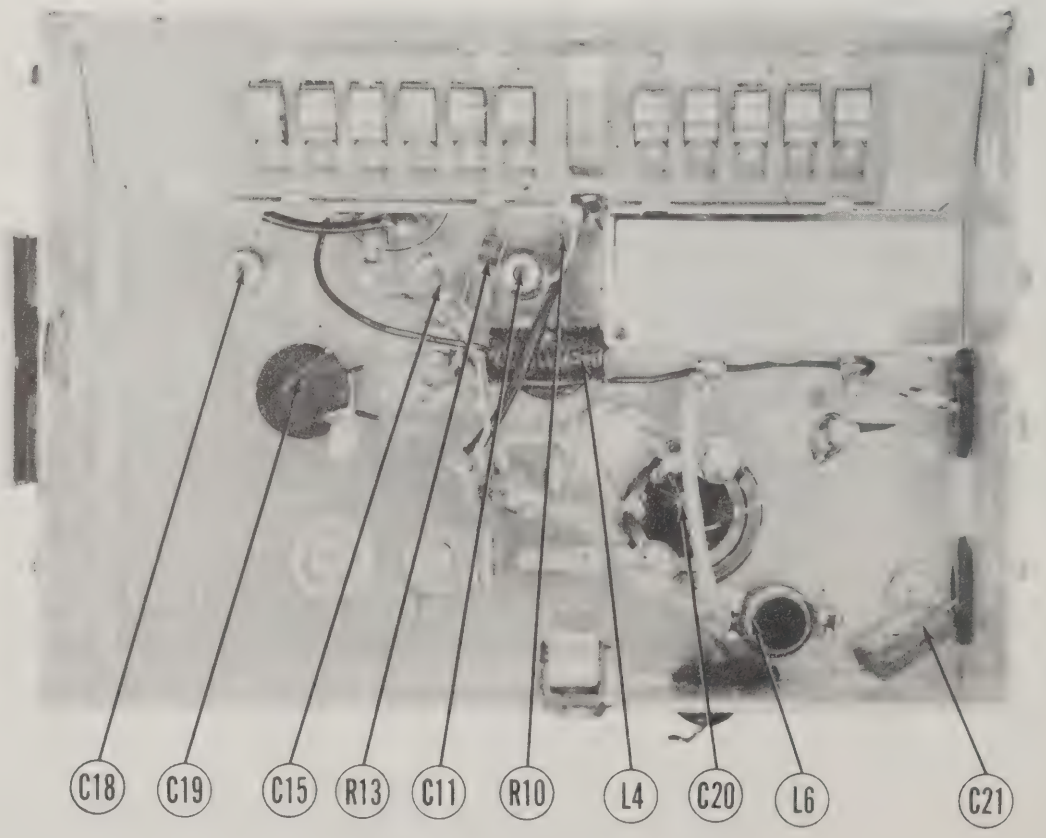
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	1.7Meg	0Ω	.1Ω	0Ω	▲1.6KΩ	▲1.6KΩ	0Ω		
V 2	6J6	▲5.1KΩ	▲420Ω	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1.6Meg	0Ω	0Ω	.1Ω	▲320Ω	▲320Ω	68Ω		
V 4	6BC5	1.6Meg	0Ω	0Ω	.1Ω	▲220Ω	▲220Ω	47Ω		
V 5	6BC5	.3Ω	68Ω	0Ω	.1Ω	▲120Ω	▲120Ω	68Ω		
V 6	6CB6	5.6KΩ	150Ω	0Ω	.1Ω	▲8.2KΩ	▲0Ω	0Ω		
V 7	6AL5	0Ω	1KΩ	.1Ω	0Ω	780Ω	0Ω	820KΩ		
V 8	6AC7	0Ω	0Ω	750Ω	8KΩ	750Ω	†16KΩ	.1Ω	▲5.6KΩ	
V 9	12AU7	▲18KΩ	1Meg	0Ω	.1Ω	.1Ω	68KΩ	0Ω	270KΩ	0Ω
V 10	6AU6	▲57KΩ	▲1KΩ	▲.1Ω	▲0Ω	†1.5KΩ	▲18KΩ	▲1KΩ		
V 11	6AL5	▲Inf.	▲Inf.	▲.1Ω	▲0Ω	▲0Ω	▲0Ω	▲44KΩ		
V 12	6AV6	▲470KΩ	▲0Ω	▲0Ω	▲.1Ω	Inf.	Inf.	†330KΩ		
V 13	6V6GT	0Ω	▲0Ω	†1.1KΩ	†400Ω	250KΩ	140KΩ	▲.1Ω	▲0Ω	
V 14	12AU7	▲22KΩ	470KΩ	0Ω	.1Ω	.1Ω	▲9.6KΩ	1Meg	3.3KΩ	0Ω
V 15	12BH7	†2KΩ	2.2Meg	5.1KΩ 120Ω	.1Ω	.1Ω	#3.5Meg #900KΩ	2Meg	0Ω	0Ω
V 16	6AL5	390Ω	390Ω	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 17	6SN7GT	5.2Meg	†6KΩ	1.5KΩ	150KΩ	†270KΩ	1.5KΩ	.1Ω	0Ω	
V 18	6BQ6GT	Inf.	.1Ω	470KΩ	▲1KΩ	470KΩ	▲0Ω	0Ω	82Ω	Top Cap #95Ω
V 19	6W4GT	Inf.	Inf.	220KΩ	Inf.	†400Ω	Inf.	#0Ω	#.1Ω	
V 20	1B3GT	PINS 1-8 HAVE INF. RESISTANCE								Top Cap #375Ω
V 21	5U4G	Inf.	370KΩ	†100KΩ	58Ω	▲0Ω	55Ω	†1.5KΩ	370KΩ	
V 22	17BP4A	0Ω	270KΩ	Pin 10 †100KΩ	Pin 11 100KΩ	Pin 12 .1Ω				

ALL MEASUREMENTS TAKEN WITH PICTURE TUBE REMOVED.
† MEASURED FROM PIN 8 OF V21.
# MEASURED FROM PIN 3 OF V19.
FOCUS CONTROL FULLY COUNTER-CLOCKWISE.
▲ MEASURED FROM PIN 8 OF V13.

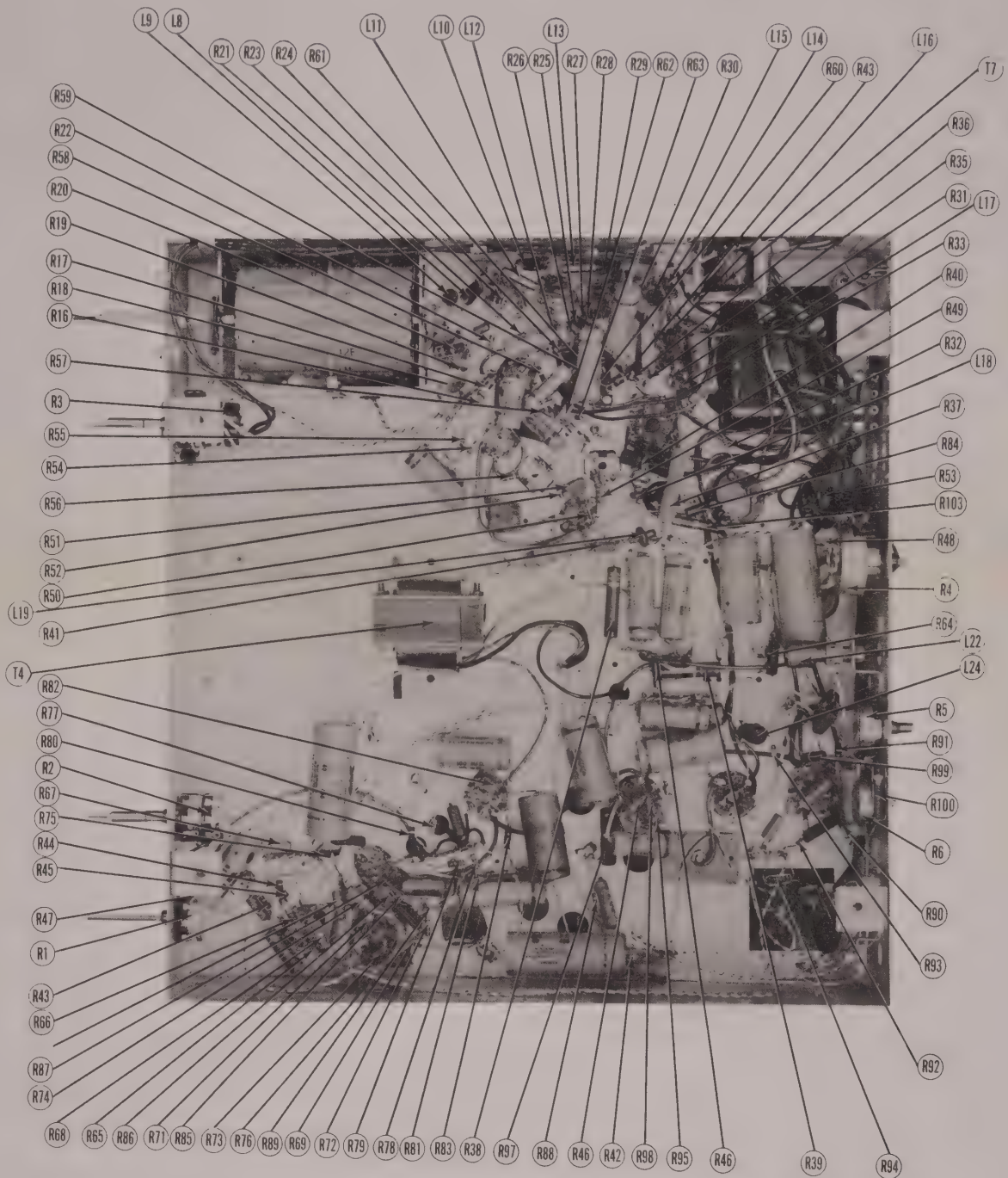
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



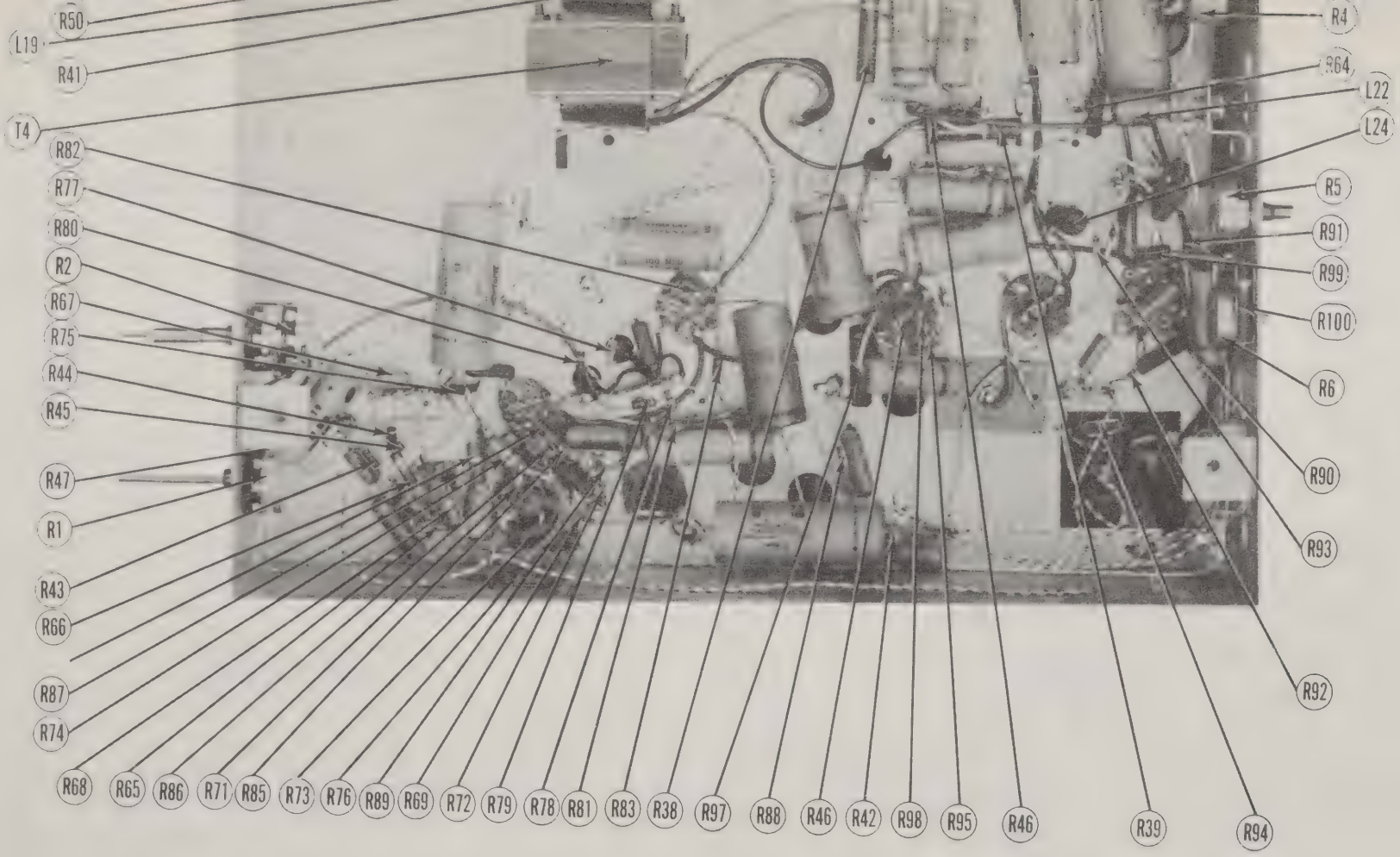
RF TUNER-RIGHT SIDE



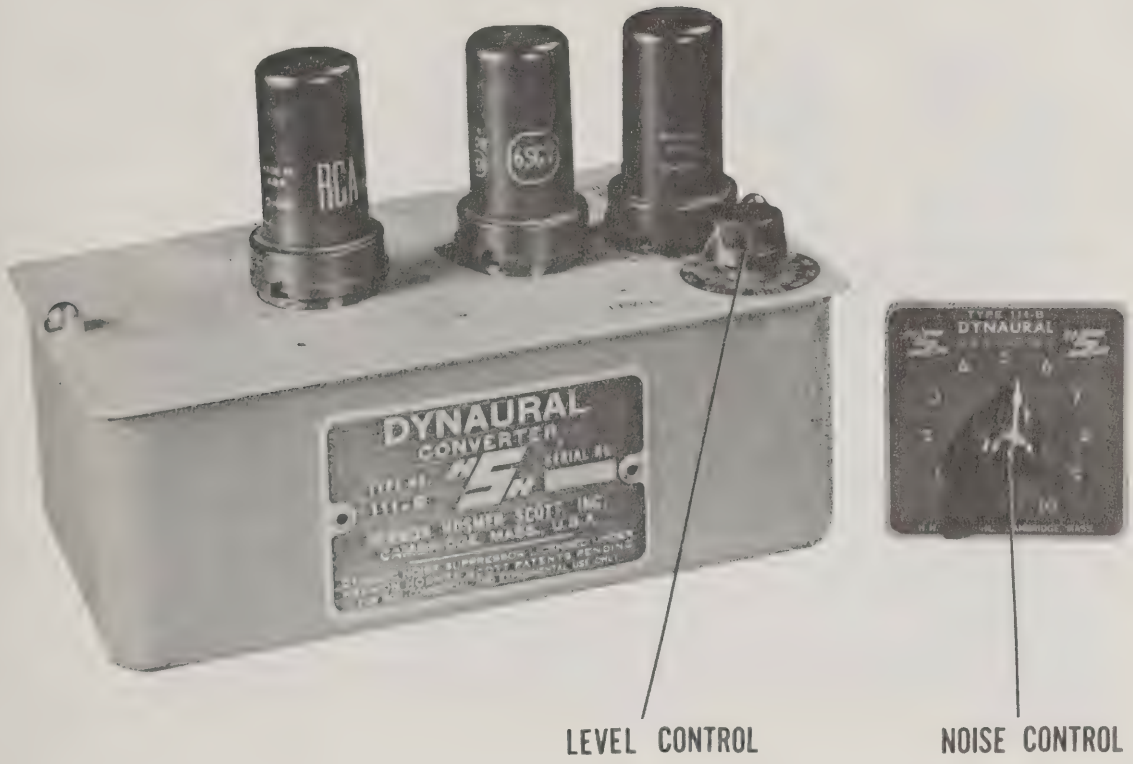
RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION



SCOTT (H. H.)
MODEL 111-B

TRADE NAME	Scott, Model 111-B (Dynaural Converter)
MANUFACTURER	H. H. Scott, Inc., 385 Putnam Ave., Cambridge, Mass.
TYPE SET	Dynaural Converter
TUBES (THREE)	Types 6SQ7 AF Amp.-Control, 6SG7 Treble Gate, 6SG7 Bass Gate
POWER SUPPLY	Adaptor Plug on Associated Amplifier

POWER

CAUTION: Turn off set or amplifier before making power connections.

The DYNAURAL CONVERTER is intended for use with sets or amplifiers having one or more of the following output tubes: 6V6, 6F6, 6L6, 6K6, in either metal or glass types. The power cable is provided with an adapter which may be fitted under one of the power tubes. The power tube plugs into the top of the adapter, and the adapter plugs into the tube socket. An advantage of this arrangement is that the CONVERTER is automatically turned "on" or "off" with the Amplifier.

When the adaptor is used, it obtains 6.3 V. at 0.8 A. Filament voltage from pins 2 and 7 and between 180 and 300 volts DC at approximately 5 ma, from pin 4 (the screen pin), pin 1 being ground. If the set does not use any of the tubes mentioned above, an octal power socket should be connected to the power supply of the receiver or amplifier to supply the above voltages at the correct pins. Most amplifiers and large console radios will supply the required power without overheating. If overheating results when the 111-A is used, or if proper voltages are not available from the set, a separate power supply should be used. A separate supply must be used with an AC-DC set.

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PARTS LIST AND DESCRIPTIONS

SCOTT
MODEL 111-B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		H. H. SCOTT PART No.	STANDARD REPLACEMENT		
V1	AF Amplifier-Control	6SQ7	6SQ7	8Q	
V2	Treble Gate	6SG7	6SG7	8BK	
V3	Bass Gate	6SG7	6SG7	8BK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	H. H. SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	10	350				BR1235A		R1120	Decoupling
B	100	15				BRH151A		R1120	Bias Filter
C	100	15				BRH151A			Bias Filter
C2	.02	200		P488-02	DF-203	PTE4S2		2TM-S2	Audio Coupling
C3	1000	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	AF Amp. Plate Dec.
C4	240	500		1468-00025		5W5T25	GP2K-241	1FM-325	Treble Gate Plate
C5	100	500		1468-0001	D6-101	5W5T1	GP1K-101	1FM-31	Audio Coupling
C6	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	AF Feedback
C7	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C8	.05	600		P688-05	DF-503	PTE6S5		6TM-S5	Audio Coupling
C9	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C10	.01	400		P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	AF Feedback
C11	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Bass Gate Filter
C12	1000	500		1468-001	D6-101	1W5D1	GP2L-102	1FM-21	Bass Diode Filter
C13	470	500		1469-0005	D6-471	5R5T5	GP2K-471	MS-35	Bass Gate Filter
C14	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Treble Diode Filter
C15	1000	500		1468-001	D6-102	1W5D1	GP2L-102	1FM-21	Treble Diode Coupling
C16	500	500		1468-0005	D6-501	5W5T5	GP2K-501	1FM-35	Treble Diode Coupling
C17	240	500		1468-00025		5W5T25	GP2K-241	1FM-325	Treble Gate Filter
C18	.02	400		P488-02	DF-203	PTE4S2		4TM-S2	Treble Gate Screen *

* Not used in all models.

CONTROLS

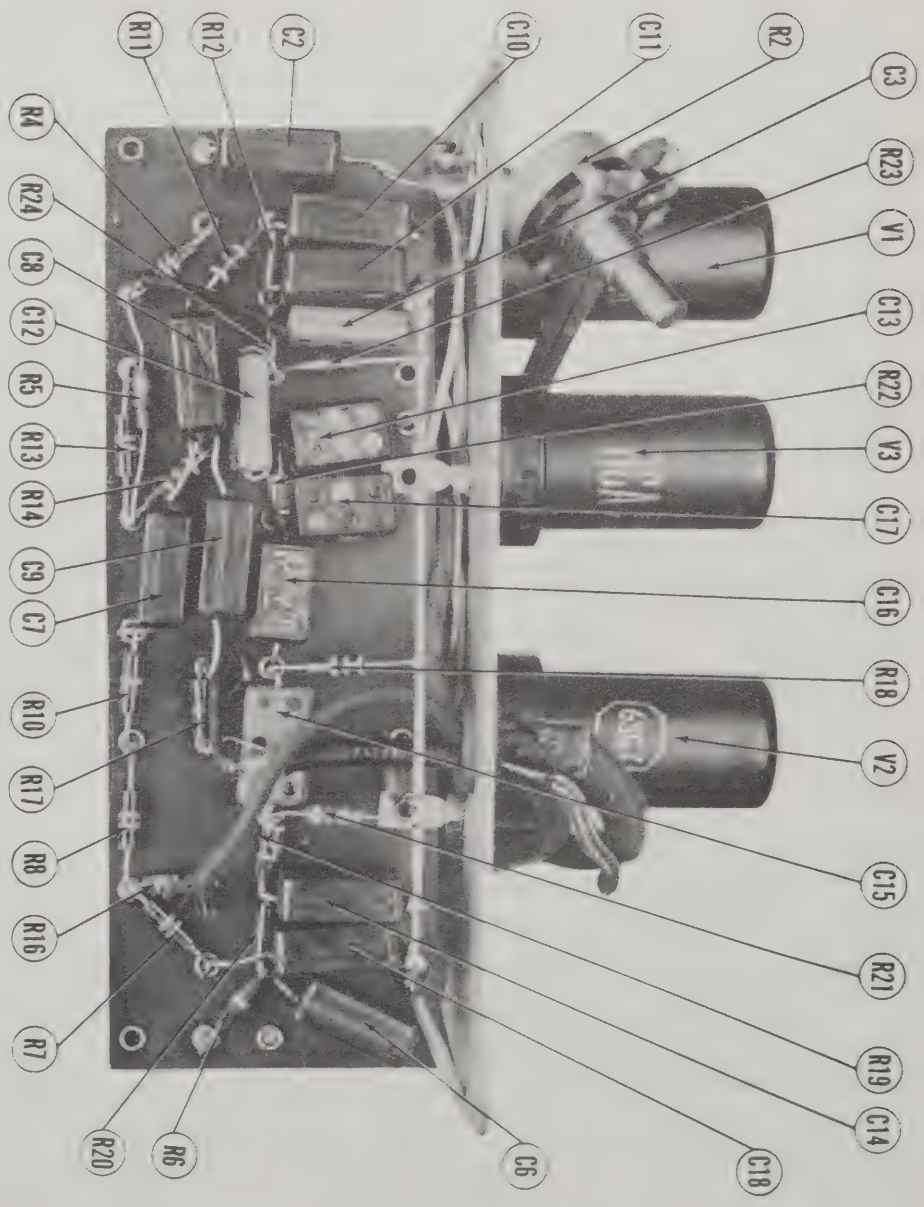
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	H. H. SCOTT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1	500KΩ	½			B-12		Level Control
R2	4000Ω	⅓					Noise Control - See Note 1

Note 1 - Some models use 2500Ω Control in this application.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	H. H. SCOTT PART No.	IRC PART No.	
R3	330Ω	½		BTS-330	Bias Network
R4	100KΩ	½		BTS-100K	AF Amp. Plate
R5	10KΩ	½		BTS-10K	Decoupling
R6	220KΩ	½		BTS-220K	Treble Gate Grid
R7	100KΩ	½		BTS-100K	Treble Gate Screen
R8	100KΩ	½		BTS-100K	Treble Gate Plate
R9	22KΩ	½		BTS-22K	Voltage Divider
R10	22KΩ	½		BTS-22K	Tone Compensation
R11	470KΩ	½		BTS-470K	Tone Compensation

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	H. H. SCOTT PART No.	IRC PART No.	
R12	2.2Meg	½		BTS-2.2Meg	Bass Gate Grid
R13	100KΩ	½		BTS-100K	Bass Gate Screen
R14	470KΩ	½		BTS-470K	Bass Gate Plate
R15	15KΩ	½		BTS-15K	Voltage Divider
R16	10KΩ	½		BTS-10K	Decoupling
R17	1Meg	½		BTS-1Meg	Output Load
R18	470KΩ	½		BTS-470K	Treble Filter Network
R19	470KΩ	½		BTS-470K	Treble Filter Network
R20	1Meg	½		BTS-1Meg	Treble Filter Network
R21	4.7Meg	½		BTS-4.7Meg	Diode Load
R22	220KΩ	½		BTS-220K	Tone Compensation
R23	2.2Meg	½		BTS-2.2Meg	Diode Load
R24	1Meg	½		BTS-1Meg	Bass Filter Network
R25	2.7Ω	5			Filament String - See Note 2
R26	220KΩ	½		BTS-220K	Tone compensation

Note 2 Some models use 2.2Ω Resistor in this application.

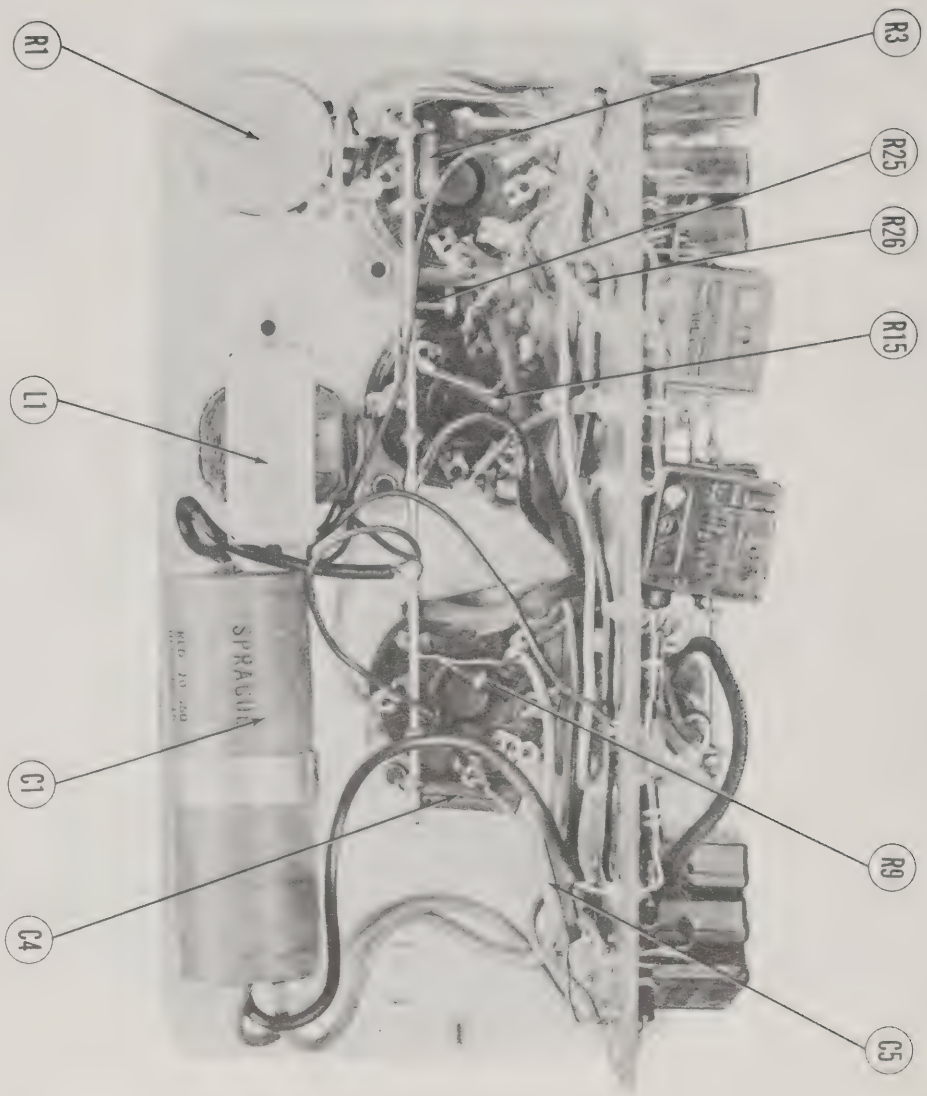
TONE CHOKE

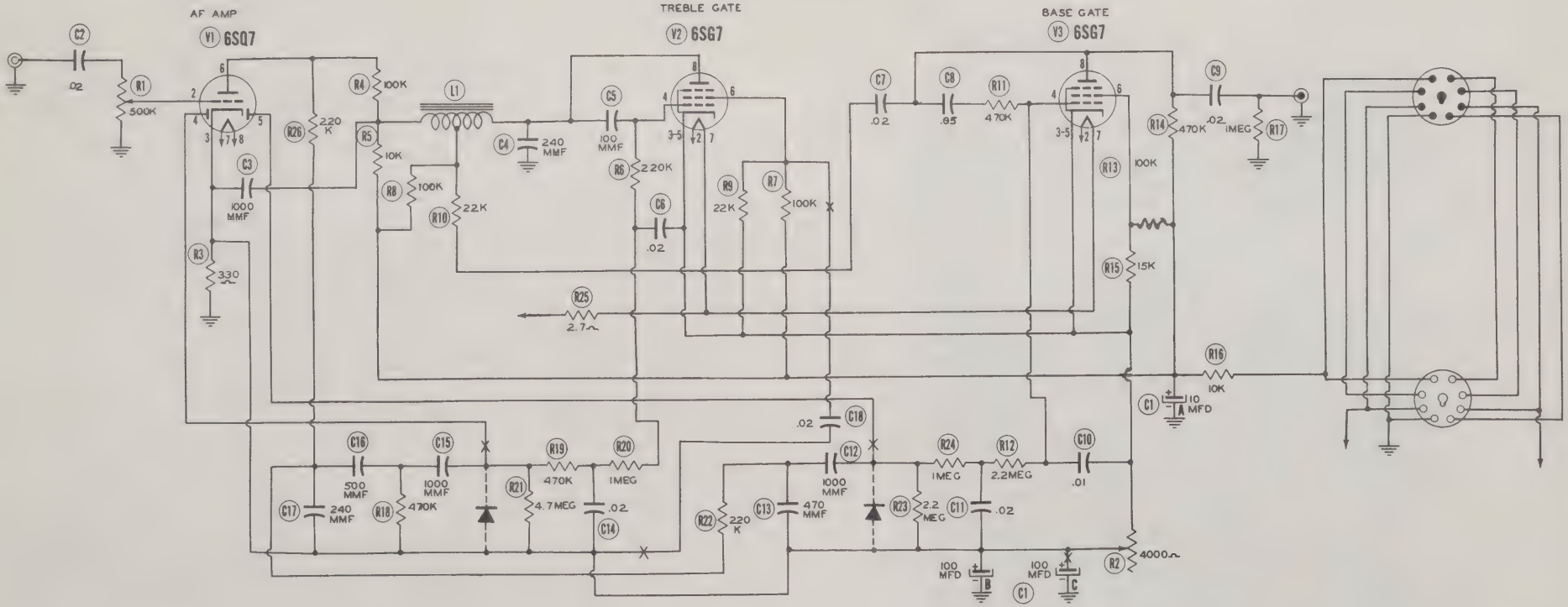
ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ~)	H. H. SCOTT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1		225Ω Tap 18Ω						

LEVEL ADJUSTMENT

The LEVEL control on the panel of the CONVERTER compensates for the sensitivity of different pickups. If the control is set too high the gate circuits may be heard opening on loud passages. If it is set too low the gate circuits will not open enough and a dead quality will result. The best setting is that at which all types of records can be played satisfactorily by merely readjusting the remote control setting and, if necessary, reducing the tone control setting on the radio or amplifier when the signal is distorted.

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SQ7	0V	0V	1.4VDC	0V	.1VDC	155VDC	¶6.3VAC	¶6.3VAC
V 2	6SG7	0V	¶4.6VAC	16VDC	0V	16VDC	55VDC	¶4.6VAC	220VDC
V 3	6SG7	0V	¶4.6VAC	16VDC	0V	16VDC	44VDC	¶4.6VAC	22VDC

¶ MEASURED ACROSS FILAMENTS

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6SQ7	0Ω	0Ω	330Ω	4.7Meg	2.2Meg	†120KΩ	▲0Ω	▲2.7Ω
V 2	6SG7	0Ω	▲2.3Ω	4.3KΩ	6.3Meg	4.3KΩ	26KΩ	▲2.7Ω	†20KΩ
V 3	6SG7	0Ω	▲2.3Ω	4.3KΩ	5.4Meg	4.3KΩ	19KΩ	▲2.7Ω	†480KΩ

† MEASURED FROM PIN 4 OF ADAPTER PLUG
▲ MEASURED FROM PIN 2 OF ADAPTER PLUG

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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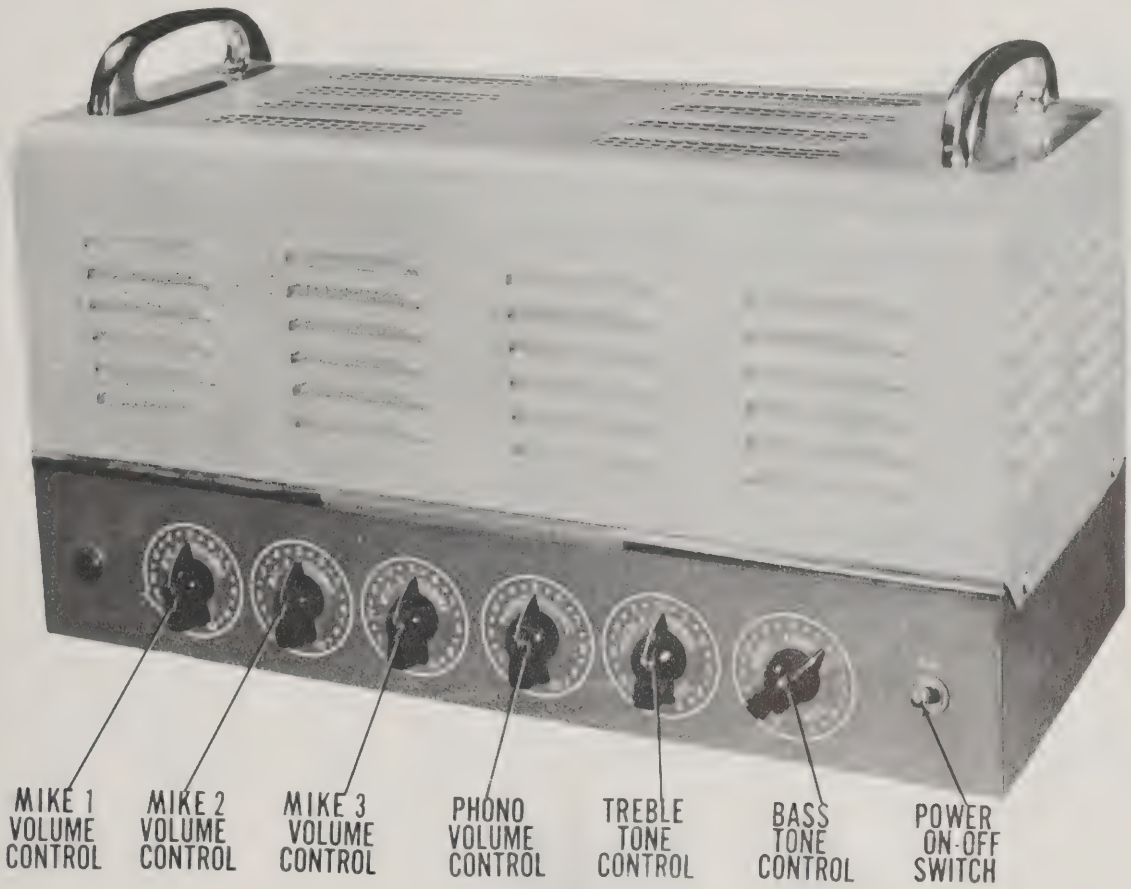
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

WEBSTER ELECTRIC
MODELS 82-25, 82-25A , 83-25



WEBSTER ELECTRIC
MODELS 82-25, 82-25A , 83-25

TRADE NAME	Webster Electric, Model 82-25, 82-25A, 83-25
MANUFACTURER	Webster Electric Co., Racine, Wisconsin
TYPE SET	AC Operated Audio Amplifier
TUBES (Nine)	Types (3) 6J7 Mic. 1, 2 and 3 Pre-Amp. , 6J7 Mixer-1st AF, 6J5 2nd AF , 6SL7GT 3rd AF-Phase-Inv., (2) 6L6G Power Output, 5Z3 or 5U4G Rectifier
POWER SUPPLY	110-120 Volts AC (Models 82-25, 82-25A, 83-25) 220-240 Volts AC (Model 82-25A RATING 1.08 Amp. @ 117 Volts AC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		Webster Electric PART No.	STANDARD REPLACEMENT		
V1	Mic. 1 Pre-Amp.	6J7	6J7	7R	
V2	Mic. #2 Pre-Amp.	6J7	6J7	7R	
V3	Mic. #3 Pre-Amp.	6J7	6J7	7R	
V4	Mixer-1st AF Amp	6J7	6J7	7R	
V5	2nd AF Amp.	6J5	6J5	6Q	
V6	3rd AF-Phase Inv.	6SL7GT	6SL7GT	8BD	
V7	Power Output	6L6G	6L6G	7AC	
V8	Power Output	6L6G	6L6G	7AC	
V9A	Rectifier	5Z3	5Z3	4C	
V9B	Rectifier	5U4G	5U4G	5T	

CAPACITORS

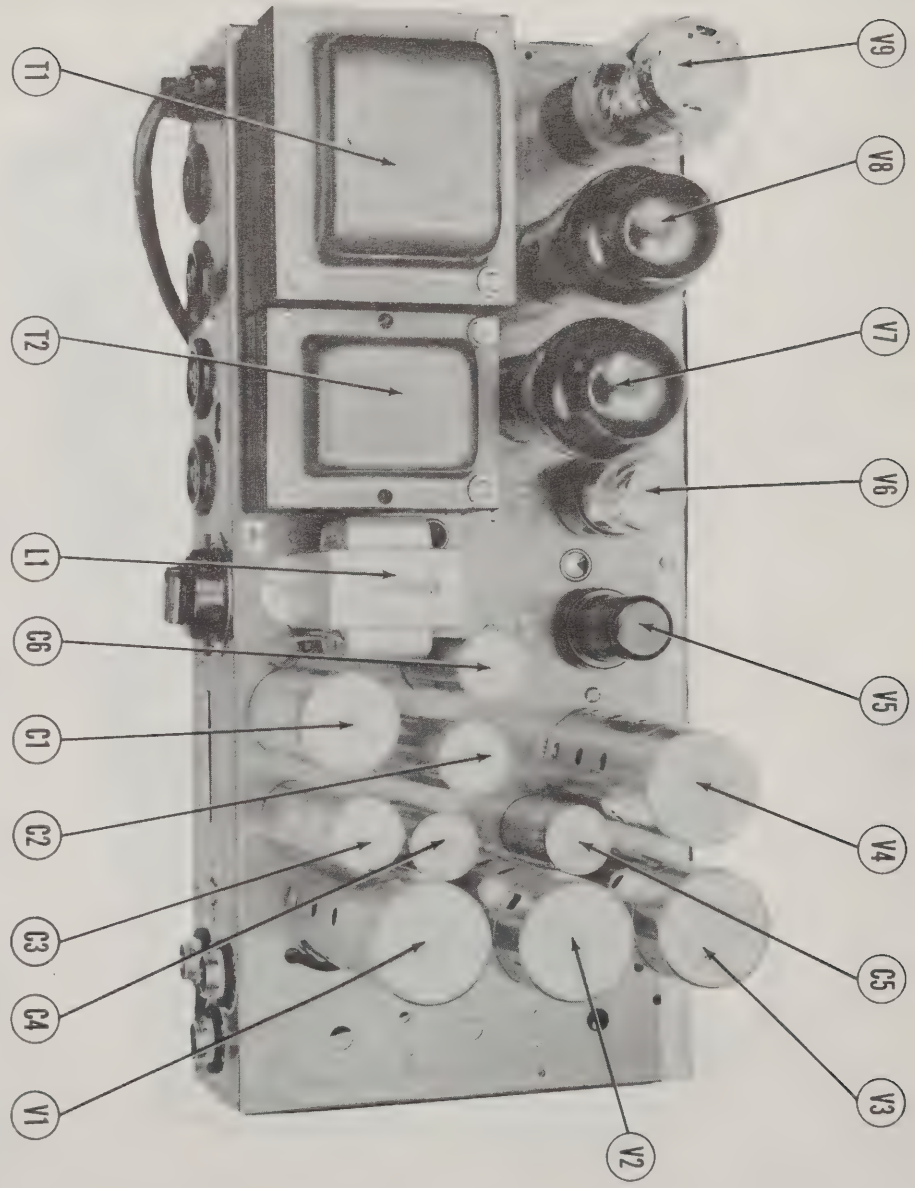
Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	Webster Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1	30	500	S4263			WR30			Filter
C2A	8	450	S4940	GL450/8-8		KRC588		PLS-88	Filter
B	8	450							Decoupling
C3A	8	450	S4940	GL450/8-8		KRC588		PLS-88	Decoupling
B	8	450							Decoupling
C4A	25	25	S4534			BRD202B			Mic. 1 Pre-Amp. Cathode
B	25	25							Mic. 2 Pre-Amp. Cathode
C5A	25	25	S4534			BRD202B			Mic. 3 Pre-Amp. Cathode
B	25	25							1st AF Amp. Cathode
C6	50	100	S4286			KR530			Output Cathode
C7	16	150	S4950	PRS150/16		BR1615		TVA-1409	Pre-Amp. Screen
C8	50	6	S6063	SRE6/50		BBR50-6		TVA-1100	2nd AF Amp. Cathode
C9	50	6	S6063	SRE6/50		BBR50-6		TVA-1100	3rd AF Amp. Cathode
C10	.02	400	211-30639	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C11	.02	400	211-30639	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C12	.02	400	211-30639	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C13	.3	400	S3939-1						1st AF Amp. Screen
C14	.02	400	211-30639	P488-02	DF-203	PTE4S2		4TM-S2	Audio Coupling
C15	1000		S6065-5	SH1000	D6-102	1W5D1	GP2L-102	5HK-D1	Tone Comp.
C16	50	500	S6043	1468-00005	D6-500	5W5Q5	GP1K-500	1FM-45	Tone Comp.
C17	100		S6065-2	SH100	D6-101	5W5T1	GP1K-101	5GAT1	Tone Comp.
C18	.01	400	211-13177	P488-01	D6-103	PTE4S1	GP2-333-103	4TM-S1	Tone Comp.
C19	1000		S6065-5	SH1000	D6-102	1W5D1	GP2L-102	5HK-D1	Tone Comp.
C20	.05	400	S4261	P488-05	DF-503	PTE4S5		4TM-S5	Audio Coupling
C21	.1	400	211-13083	P488-1	DF-104	PTE4P1		4TM-P1	Audio Coupling
C22	.1	400	211-13083	P488-1	DF-104	PTE4P1		4TM-P1	Audio Coupling
C23	1000		S6065-5	SH1000	D6-102	1W5D1	GP2L-102	5HK-D1	Output Grid

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	Webster Electric PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	S3911	Q13-133	AM-60-Z	B-60	Mike 1 Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R1A Per Instructions
R2A	500KΩ	½	S3911	Q13-133	AM-60-Z	B-60	Mike 2 Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R2A Per Instructions
R3A	500KΩ	½	S3911	Q13-133	AM-60-Z	B-60	Mike 3 Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R3A Per Instructions
R4A	500KΩ	½	S3911	Q13-133	AM-60-Z	B-60	Phono Volume Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R4A Per Instructions
R5A	500KΩ	½	S3911-4	Q13-133	AM-60-Z	B-60	Treble Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R5A Per Instructions
R6A	500KΩ	½	S3911-4	Q13-133	AM-60-Z	B-60	Bass Control
B	Shaft		Not Req.	Not Req.	RS-2	Not Req.	Attach to R6A Per Instructions

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA Webster Electric PART No.	IRC PART No.	IDENTIFICATION CODES
	RESISTANCE	WATTS			
R7	2.2Meg	½	2950I-60	BTS-2.2Meg	Mike Input Shunt-See Note
R8	2.2Meg	½	2950I-60	BTS-2.2Meg	Mike Input Shunt-See Note
R9	2.2Meg	½	2950I-60	BTS-2.2Meg	Mike Input Shunt-See Note
R10	2000Ω	½	2950I-14		Mike 1 Pre-Amp Cathode
R11	240KΩ	½	2950I-48		Mike 1 Pre-Amp Plate
R12	2000Ω	½	2950I-14		Mike 2 Pre-Amp Cathode
R13	240KΩ	½	2950I-48		Mike 2 Pre-Amp Plate
R14	2000Ω	½	2950I-14		Mike 3 Pre-Amp. Cathode
R15	240KΩ	½	2950I-48		Mike 3 Pre-Amp. Plate
R16	200KΩ	½	2950I-47		Mike Pre-Amp. Screen Dropping
R17	75KΩ	½	2950I-37		Voltage Divider
R18	1.5Meg	½	2950I-59	BTS-1.5Meg	Isolation
R19	1.5Meg	½	2950I-59	BTS-1.5Meg	Isolation
R20	1.5Meg	½	2950I-59	BTS-1.5Meg	Isolation
R21	1.5Meg	½	2950I-59	BTS-1.5Meg	Isolation
R22	22KΩ	½	2950I-29	BTS-22K	Decoupling
R23	1000Ω	½	2950I-11	BTS-1000	1st AF Amp. Cathode
R24	510KΩ	½	2950I-53		1st AF Amp. Screen
R25	100KΩ	½	2950I-41	BTS-100K	1st AF Amp. Plate
R26	22KΩ	½	2950I-29	BTS-22K	Decoupling
R27	240KΩ	½	2950I-48		Tone Compensation
R28	1Meg	½	2950I-56	BTS-1Meg	Tone Compensation
R29	510KΩ	½	2950I-53		Tone Compensation
R30	510KΩ	½	2950L-53		Tone Compensation
R31	2400Ω	½	2950I-15		2nd AF Amp. Cathode
R32	100KΩ	½	2950I-41	BTS-100K	2nd AF Amp. Plate
R33	22KΩ	½	2950I-29	BTS-22K	2nd AF Amp. Decoupling
R34	2Meg	½	2950I-95		Tone Compensation
R35	240KΩ	½	2950I-48		3rd AF Amp. Grid
R36	2000Ω	½	2950I-14		3rd AF Amp. Cathode
R37	100Ω	½	2950I-3	BTS-100-5%	3rd AF Amp. Cathode
R38	240KΩ	½	2950I-48		3rd AF Amp. Plate
R39	6200Ω	½	2950I-22		Phase Inv. Grid
R40	2000Ω	½	2950I-14		Phase Inv. Cathode
R41	240KΩ	½	2950I-48		Phase Inv. Plate
R42	100KΩ	½	2950I-40	BTS-100K	Output Grid
R43	100KΩ	½	2950I-40	BTS-100K	Output Grid
R44	225Ω	5	2950Ω-13	1 3/4A-225	Output Cathode
R45	1000Ω	1	2950I-71	BTA-1000-5%	Feedback Network
R46	1000Ω	5	2950Ω-15	1 3/4A-1000	Filter-Wire Wound
R47	10KΩ	25	29504-4	2½DA-10K	Bleeder-Wire Wound
R48	10Ω	½	9950I-94	BW-½-10	Series Pilot Light

Note-Not used in model 83-25.

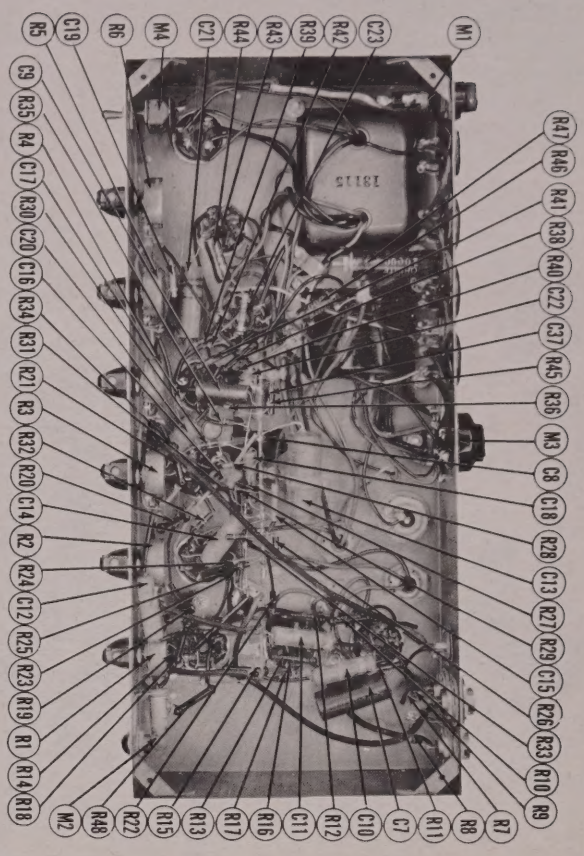
TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA Webster Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
	PRI.	SEC. 1	SEC. 2	SEC. 3				
T1	117VAC @1.08A	670VCT .146ADC	5VAC @3A	6.3VAC @3.7A	212-13115			

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA Webster Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
	IMPEDANCE		DC RES.						
	PRI.	SEC.	PRI.	SEC.					
T2	2.5KCT	2Ω	170ΩCT	.25Ω					
		4Ω		.3Ω					
		8Ω		.5Ω					
		16Ω		.8Ω					
		125Ω		4.8Ω					
		250Ω		8.2Ω					
		500Ω		13Ω					

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (MIC. INPUT)

ITEM No.	RATING				REPLACEMENT DATA Webster Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
	PRI.	SEC. 1	SEC. 2	SEC. 3				
T3	37.5Ω① 150Ω②	37,500Ω	15Ω	3500Ω	212-13168 ③			
T4	37.5Ω① 150Ω②	37,500Ω	15Ω	3500Ω	212-13168 ③			
T5	37.5Ω① 150Ω②	37,500Ω	15Ω	3500Ω	212-13168 ③			

① Wired in parallel.
② Wired in series.
③ Used only in model 83-25

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA Webster Electric PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ↭)					
L1	044A	560Ω	20Henries	212-14393				

FUSES

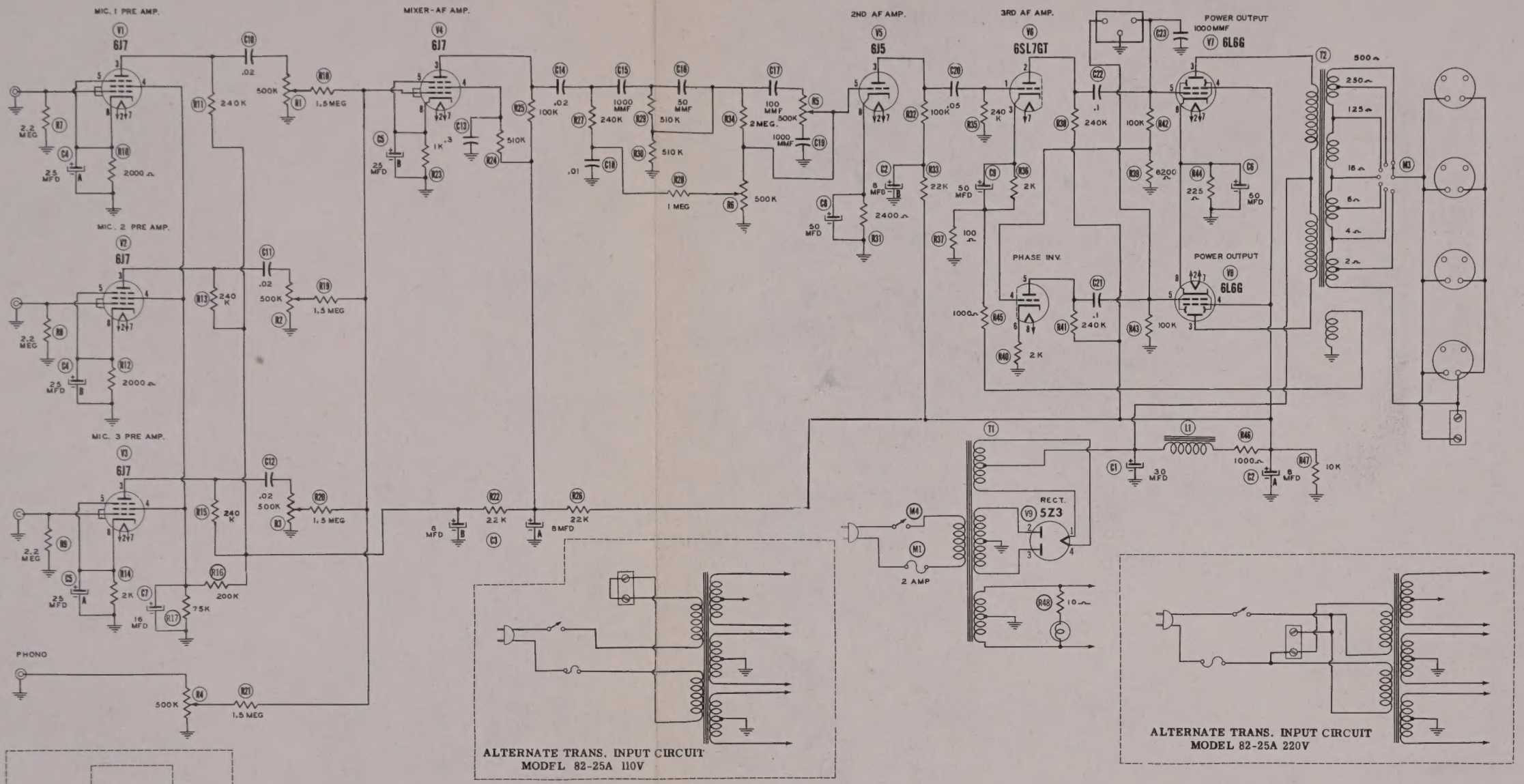
ITEM No.	TYPE	RATING	REPLACEMENT DATA WEBSTER ELECTRIC PART No.		LITTELFUSE PART No.		REMARKS
			FUSE	HOLDER	FUSE	HOLDER	
M1	3AG	2A	P8755-7		312002	342001	

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA Webster Electric PART No.		NOTES
M2	Bayonet	75	.2	White	P-8914-1		Type number 51.

MISCELLANEOUS

ITEM No.	PART NAME	Webster Electric PART No.	NOTES
M3	Switch	S6211-2	Impedance Selector
M4	Switch	S2706	On-Off



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6J7	0V	¶	70VDC	27VDC	1VDC	170VDC	¶	1VDC	0V
V 2	6J7	0V	¶	80VDC	27VDC	1VDC	170VDC	¶	1VDC	0V
V 3	6J7	0V	¶	54VDC	27VDC	1VDC	0V	¶	1VDC	0V
V 4	6J7	0V	¶	90VDC	50VDC	1.4VDC	255VDC	¶	1.4VDC	0V
V 5	6J5	0V	¶	90VDC	0V	0V	0V	¶	3.7VDC	
V 6	6SL7GT	0V	120VDC	1.4VDC	0V	120VDC	1.4VDC	¶	¶	
V 7	6L6G	0V	¶	350VDC	290VDC	0V	0V	¶	22VDC	
V 8	6L6G	0V	¶	350VDC	290VDC	0V	0V	¶	22VDC	
V 9	5Z3	350VDC	320VAC	320VAC	350VDC					

¶ 6.3VAC MEASURED ACROSS FILAMENTS.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6J7	0Ω	.1Ω	†285KΩ	†50KΩ	2KΩ	†45KΩ	.1Ω	2KΩ	3.2Meg
V 2	6J7	0Ω	.1Ω	†285KΩ	†50KΩ	2KΩ	†45KΩ	.1Ω	2KΩ	3.2Meg
V 3	6J7	0Ω	.1Ω	†285KΩ	†50KΩ	2KΩ	0Ω	.1Ω	2KΩ	3.2Meg
V 4	6J7	0Ω	.1Ω	†123KΩ	†539KΩ	1KΩ	†22KΩ	.1Ω	1KΩ	400KΩ
V 5	6J5	0Ω	.1Ω	†122KΩ	1Ω	500KΩ	500KΩ	.1Ω	2.4KΩ	
V 6	6SL7GT	240K	†240KΩ	2.1KΩ	6.2KΩ	†240KΩ	2KΩ	.1Ω	.1Ω	
V 7	6L6G	0Ω	.1Ω	†85Ω	†1.5KΩ	100KΩ	0Ω	.1Ω	225Ω	
V 8	6L6G	0Ω	.1Ω	†85Ω	†1.5KΩ	100KΩ	Inf.	.1Ω	225Ω	
V 9	5Z3	1.5KΩ	460Ω	500Ω	1.5KΩ					

† MEASURED FROM PIN 4 PF V9.

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PHOTOFACT STANDARD NOTATION SCHEMATIC

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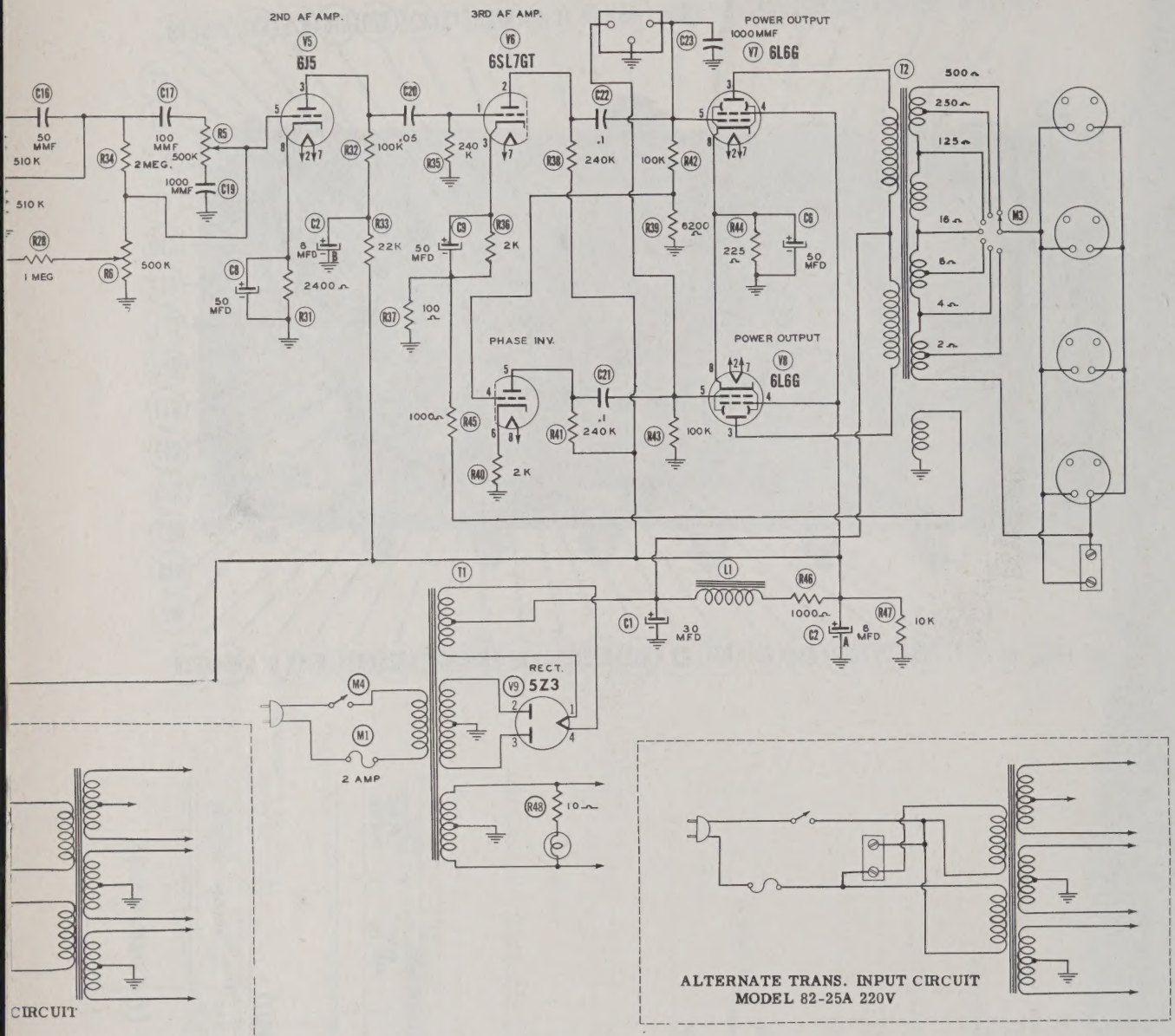

Pin 7	Pin 8	Top Cap
¶	1VDC	0V
¶	1VDC	0V
¶	1VDC	0V
¶	1.4VDC	0V
¶	3.7VDC	
¶	¶	
¶	22VDC	
¶	22VDC	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Top Cap
V 1	6J7	0Ω	.1Ω	†285KΩ	†50KΩ	2KΩ	†45KΩ	.1Ω	2KΩ	2.2Meg
V 2	6J7	0Ω	.1Ω	†285KΩ	†50KΩ	2KΩ	†45KΩ	.1Ω	2KΩ	2.2Meg
V 3	6J7	0Ω	.1Ω	†285KΩ	†50KΩ	2KΩ	0Ω	.1Ω	2KΩ	2.2Meg
V 4	6J7	0Ω	.1Ω	†123KΩ	†533KΩ	1KΩ	†22KΩ	.1Ω	1KΩ	400KΩ
V 5	6J5	0Ω	.1Ω	†122KΩ	1Ω	500KΩ	500KΩ	.1Ω	2.4KΩ	
V 6	6SL7GT	240K	†240KΩ	2.1KΩ	6.2KΩ	†240KΩ	2KΩ	.1Ω	.1Ω	
V 7	6L6G	0Ω	.1Ω	†85Ω	†1.5KΩ	100KΩ	0Ω	.1Ω	225Ω	
V 8	6L6G	0Ω	.1Ω	†85Ω	†1.5KΩ	100KΩ	Inf.	.1Ω	225Ω	
V 9	5Z3	11.5KΩ	460Ω	500Ω	11.5KΩ					

† MEASURED FROM PIN 4 PF V9.

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